Pests

AND THEIR CONTROL

1945

MARCH

VOL. 13 NO. 3

ORGAN OF THE PEST CONTROL INDUSTRY

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EDITORIAL

DDT and the Outlook for PCO's

COMPETENT ANALYSTS tell us that we can have a decent level of postwar business only if there is an increased output of goods and services after the war, requiring a production level 60 to 70 per cent greater than in 1939. But the problem for PCO's is not basically one of production. It is an expression of the desire to sell the public the importance of PCO service. Before we try to point out how PCO's can profit by the new amazing insecticide that has greatly alarmed many PCO's who recently attended the National Convention held at Chicago, may we cite some facts.

Much has been said and is still being said about DDT. Many have felt that this new miracle of insecticides would blot out the PCO's present business. Many were asking what they were to do when the public learned of this marvelous insect killer. This question has brought painful concern to many, and to be frank, one could not feel otherwise than concerned since there has been such an avalanche of articles and news since the discovery of its usefulness.

There is no question that DDT will have its place among the best insecticides and will be an important factor in PCO service. There will be changes in technique of application as well as new methods in the approach toward the PCO service work; however, there is much that must still be done by way of research.

From the standpoint of the public or householder, PCO's should have no fear that DDT will put them out of business. Why should PCO's feel so, since the general public is not expected to know the habits of insects, where to look for them, the specifics required for control, or how to obtain results.

The comforting and consoling fact is that DDT, like every new product or item that shows its face on the market, has its heyday, and like a new game or toy, people will play with it and talk about it until they forget and look for something new to come on the market. News of a newly-discovered medicine is broadcasted and receives wide advertising, but later it is usually found that while much good is obtained from its use, there are also unfavorable results. No new product or material is so good that it does not have its drawbacks as well as its good points. It works both ways.

"Ye Ed" is convinced that while the public for a while may use DDT and obtain excellent results, yet, negative effects will appear sooner or later. There are individuals who have sensitive skin and individuals who are susceptible to skin disease and irritation. Use of highly toxic material will subject "Mr. John Q" to such irritation and skin trouble, causing him alarm and concern and eventually leading him to seek medical aid. Physicians will soon learn that this powerful insect killer is not only affecting the insects, but also the individuals. They will caution those who are having skin trouble to be careful in the use of this material, or better still, to obtain the service from those who are trained to use and handle such products. In most cases, as with individuals using home-made or patent medicine who, discovering that their condition is worse than before, seek the services of a competent physician instead of trying to treat themselves, the public will turn to the experienced PCO for relief. There is little reason, if any, for PCO's not to look forward to reaping a good harvest, instead of fearing loss of their business.

Then, too, the PCO of the future should look forward to more training in entomology so that he will be in a position to cope with any problem that arises. This should indelibly impress on the mind of every PCO that attendance of the National Conventions, Conferences and various meetings held each year, is exceedingly important. Let not any PCO think that there isn't very much more to learn. By failing to take advantage of these meetings, you will be the one who will blot yourself out of business, not the DDT or any other newly-discovered product that may come on the stage of action.

Let every PCO keep in mind that the service he renders to the public is more than a profession; it is more than an art; it is a service to mankind. As long as this fact remains there is little to fear that this profession will fade out of the picture.

Termites Cause Building Collapse?

AN OLD CANARD has reared its head again, this time in the January 2 issue of The (New Orleans) Times-Picayune. Illustrating the collapse of a loft building in downtown N. Y., the story attributes the destruction to termites.

A subsequent check with the New York Department of Buildings, on the part of a member of the industry, discloses that, while the Department has not as yet determined fully the cause of the collapse, it has definitely eliminated as a possible cause termite damage.

Underscoring the Department's conclusion is a statement by a noted authority on termites in which he declares, in part, "that the risk of sudden collapse strictly from termite injury of any fairly well-constructed building is very improbable in the continental United States," and that he knows "of no such cases." Concluding, he says: "For many years I have investigated the recorded collapse of buildings due to termites . . . In no instance have I found termites responsible for such collapse."

Scare-head publicity of the type herein referred to is definitely not in the public interest. It is not in the public interest because it can, and often does, create an exaggerated fear in the public mind of termite damage to buildings, which becomes grist to the mill of the opportunistic termite control operator and also manufacturer of chemicals used for termite control. And to the extent that it does, it places the industry in a false light and poses a threat to the legitimate interests of the ethical operator in particular.

Reprints of Articles

Requests have been made from time to time relative to reprints of articles being available. This publication will make possible reprints of any article in this issue if orders are received within 10 days of receipt of this publication. Charges are based on the length of the article.

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BETTER THINGS FOR BETTER LIVING...*THROUGH CHEMISTRY*

PESTS OUTSIDE THE FOUR WALLS

By **A. I. BOURNE,** *Massachusetts Apricultural Experiment Station*

Editor's Note: This paper was read at The Eastern Pest Control Operator's Conference, Massachusetts State College, Amherst, Mass., February 7, 1945.

THIS SUBJECT represents the venture into a new area of activity. It involves facing several important factors incidental to agricultural and horticultural practices which differ in marked degree from the problems of pest control within the confines of the building itself. In attempting to navigate in new waters, it is desirable to become acquainted with the shoals and reefs which may exist and some of the precautions necessary to keep within safe channels.

In any agricultural activity we are constantly encountering new angles and difficulties which complicate our problems and sometimes throw the best-laid plans out of line, but many of the basic factors have been met and many of the problems solved. Some of these more or less basic factors will be mentioned here, particularly those which make the question of control of agricultural pests more or less distinctive.

Control of the insects and diseases that affect fruit and vegetable crops is essential for the success of the millions of farm, suburban and city community gardens and backyard orchards. Food production from these sources, especially during the war emergency, is of extreme importance. Not only does it aid in relieving food shortages and in solving the food transportation and distribution problems, but it releases labor from other employment and means substantial saving of critical materials otherwise needed for commercial canning of many vital food products. Regardless of the care taken in the selection of a garden site and in its preparation, planting and cultivation—all of which involve use of more or less scanty supplies of farm machinery, fertilizers, and seeds, the whole enterprise may become valueless by the depredation of insect pests and plant diseases unless properly timed and thoroughly executed steps are taken to control them.

The extermination of household pests is no longer (if it ever was) governed by haphazard, rule-of-thumb regulations and practices. Rather it is a skilled procedure requiring the employment of scientific methods and of persons possessing a considerable degree of technical skill and knowledge.

This statement of fact applies with even more significance to the field of control of the pests of gardens, fruits, and ornamentals on the premises outside the home. The crops to be considered are many and various and each has its own "galaxy" of insect pests (suckers, chewers, and borers) and plant diseases of as many types and sorts. The number of pests alone is considerable and the problem of their control is even more complicated because of the interrelation of environmental factors—weather, soil, exposure, and influence of surrounding areas. On top of all is the matter of personal pride or of sentiment centered in the garden, lawn or some particular bit of ornamental growth which makes it assume a prominence far out of proportion to its actual intrinsic value.

Elements of a Pest Control Program Other Than Spraying or Dusting

To be in position to give effective counsel and advice on garden pests, it is necessary to keep in mind the association of crops by families (cucurbits—squash, cucumbers, and melons; crucifers (cabbage, cauliflower, broccoli, etc.), since most of the crops are subject not only to their own special pests but inherit many of the insect pests and plant diseases common to their family. Insects, after all, have proved to be good botanists, and diseases have, too.

To make the problem even harder and add to the general difficulty, there is the fact that many of our common weeds which usually surround planted areas are more or less related to some of the garden crops, and on many of these, insect pests and diseases may at least exist if not thrive, and from which, these pests may spread over into the planted areas.

In any comprehensive program of pest control, consideration must be given to different steps or practices other than spraying or dusting which represent not only good agricultural procedure but in many cases have a profound and beneficial effect in preventing or lessening the attack of pests.

Crop Rotation. The purpose of crop rotation is to escape damage in a crop from insects and disease organisms that have accumulated in a field as a result of growing that particular crop or related crops there, and the pests that are able to persist there for one or more years. It also involves the growing of some other crop in the same location not subject to the same pests, and thus allows the latter to become reduced in population through withholding their favorite food plants.

Sanitation. Sanitation involves the removal or destruction of diseased or insect-infested plants and crop refuse, as well as of nearby weeds that are capable of harboring insects and diseases. It also includes on the part of the grower the precautions to avoid introducing and spreading insects and diseases in the field.

Resistant Varieties. It is advisable, where practicable, to choose varieties that are known to be less subject to attack by certain insect pests; or varieties that have been developed for resistance to diseases.

Seed Treatment. Its purpose is two-fold. The first is to destroy, through chemical or heat tratments, disease organisms harbored on or inside the seed; for example, diseases of crucifers, cucurbits, tomato, and eggplant. The second is to protect seeds from decay and the seedlings from disease and insect attack by soil-borne pests; for example, damping-off, onion maggot, and carrot rust fly. In such a treatment various dry materials are employed, including cuprous oxide, Semesan, Arasan, Spergon, and calomel.

Soil Treatment. It is aimed to destroy disease organisms in seed- and transplant-beds, hotbeds and greenhouse benches and floor beds by (1) partial disinfection for control of damping-off (mild formaldehyde treatment) and by (2) soil sterilization (steaming, formaldehyde, acetic acid, chloropicrin). It is also used to destroy or repel insects (mercury treatments for cabbage maggot and naphthalene flashes for carrot rust fly).

Planting Dates. It is, in some cases, possible to avoid serious injury from certain pests by the proper timing

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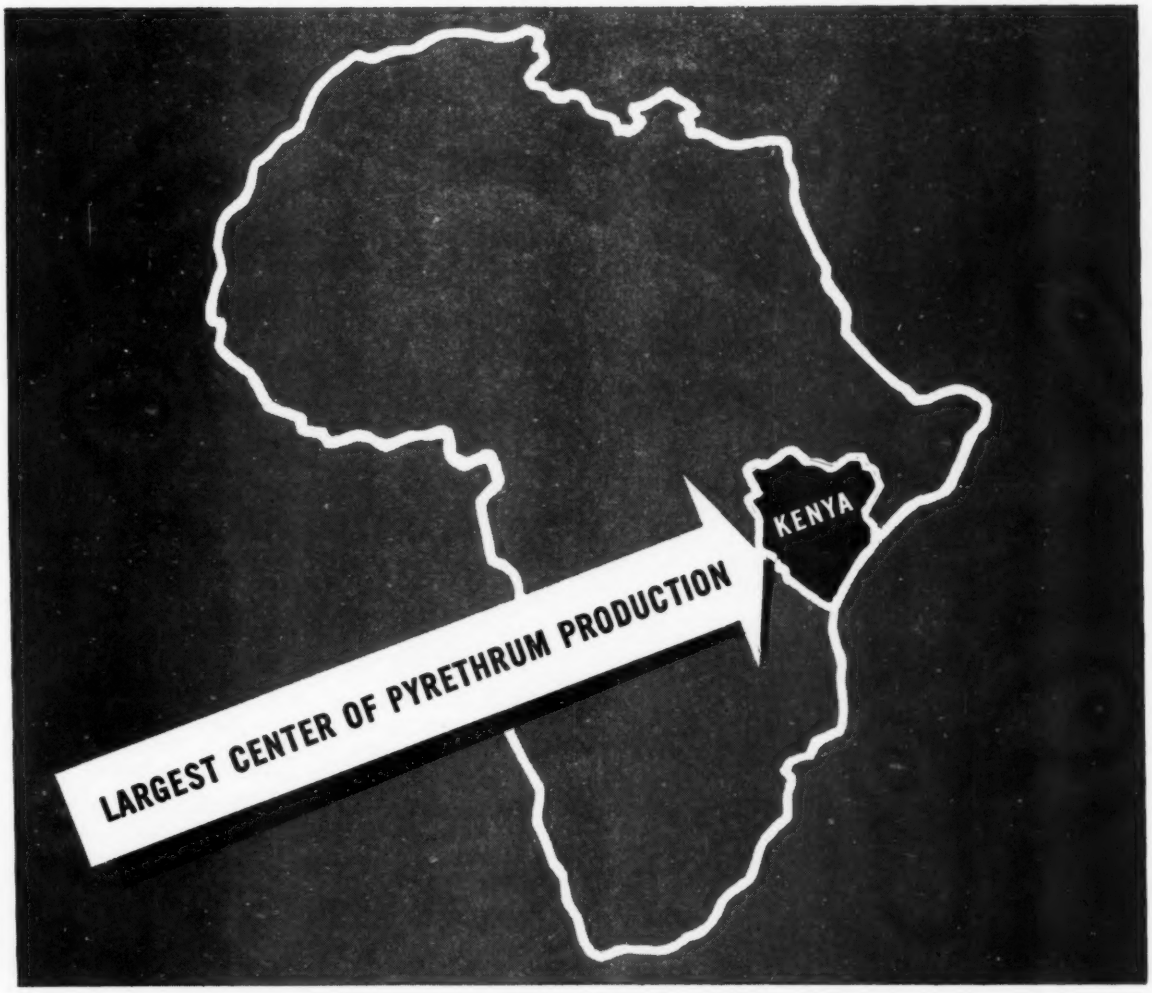

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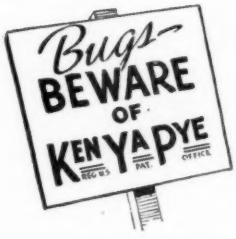

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of planting in relation to the seasonal development of the pest to be avoided (late planting of beans for seed corn maggot, midseason sweet corn for corn borer, late planting of crucifers for cabbage maggot).

General Methods of Control

The foundation of successful pest control is an accurate knowledge of the habits and life history of the insects and of the effect of environment on them, and it is only when these problems have been faced and solved that the chemical and mechanical means of combating insects can be properly utilized. So far as has ever been discovered there is no effective short cut to successful pest control, and the elimination of antiquated, outmoded methods is fully as essential as the weeding out of poor materials.

Three fundamental principles form the basis of successful pest control, aside from the matter of actual processes or methods.

1. Proper timing of treatment
2. Thoroughness of application (whatever the method)
3. Suitable means (both materials and equipment for use).

Correct timing is often of greater importance than choice of materials. In the life cycle of most insects there are brief periods when the insects are vulnerable to insecticides or cultural practices. These periods can only be determined with any certainty from an accurate knowledge of the complete life history of the insect.

Thoroughness involves more than slopping on an ample amount of material. It includes sufficient material applied in the proper manner to the plants or parts of the plants usually infested by the pest. Suitable materials applied in a haphazard way will not in most cases give very satisfactory results. (Run-off and increased danger of burning.)

Metamorphosis

Insects may be divided into two general groups on the basis of their life history, i. e., complete metamorphosis and incomplete.

Complete metamorphosis applies to insects which undergo a complete change in form and appearance in their growth from young to adult (egg—larva—pupa—adult). Examples: moths—caterpillars; beetles—grubs; flies—maggots, etc.

As a rule the chief damage caused by this group is done by the feeding of the larvae, but it is essential that the grower (operator) should learn to recognize **all** stages since control measures are often applicable to stages other than the larvae; in fact, in the case of some species there is **no** control that can effectively be applied to larvae. (Apple maggot, etc.) (Bait pails to collect codling moths and give proper timing of sprays.)

Insects having incomplete or partial metamorphosis for the most part show only slight change from young to adult except for size and for the appearance of wings, etc. (Grasshoppers, plant bugs, aphid, leafhoppers, etc.)

Types of Mouth Parts

For purposes of **control,** insects must be further classified by their manner of feeding and their structural equipment. Therefore the selection of insecticides is largely based on this factor.

Stomach poisons are intended to be applied to the leaves, bark or fruit and are taken into the body of those insects which bite off, chew, and swallow particles of plant material. Such species are termed biting or chewing insects and include various caterpillars, grubs, slugs, etc. Compounds of arsenic, fluorine, etc., belong in this group of insecticides.

Contact insecticides are employed against those insects which pierce the surface of the plant and, by means of a tubular beak, extract plant fluids. For such insetcs it is necessary to apply insecticides which kill by actual contact with the body of the insect causing death by paralysis, break-down of the body tissue or softening of the protective covering (scale insects—armored), and sealing the insect to the plant surface. Sulfur compounds, soaps, oils, nicotine compounds (also a fumigant), dinitro compounds, derris, and pyrethrum are examples. Some materials may find a place in both types.

Economical and Efficient Use of Spray Materials

This nation-wide effort to increase food production is of sufficient importance to make it necessary that those who act in any capacity as advisors in the home orchard and garden program be as fully informed as possible on the sources, supplies and efficient use of the various chemicals (insecticides and fungicides) needed for pest control.

At the present time the supply of many of our spray materials is becoming depleted and replacements are difficult. It is necessary, therefore, to use materials available to best advantage, and to keep in mind that careful application of moderate amounts will give better results than careless use of large amounts or heavy dosage.

Injury to Plants from Improper Use of Spray Materials

Spray materials (insecticides and fungicides) if not properly prepared and applied judiciously may seriously damage plant tissue or mar the appearance of flowers. Promiscuous use of such materials is not only inefficient but often dangerous. Insecticides and fungicides, as a rule, are not beneficial to plant life, and it is only when the good they accomplish by preventing or terminating disease or insect depredations overbalances their possible injury that their use on plants is justified.

The margin of safety between the amount a plant will tolerate and the amount necessary to control the pest is often very narrow. In many cases this will eliminate certain effective materials. Improper application or ignoring the effect of weather conditions often leads to unpleasant experiences.

Plants differ greatly in their tolerance for different sprays. Lead arsenate is the standard arsenical for fruit pests. This material is very toxic to bean foliage. On the other hand magnesium arsenate can be safely used on bean foliage (it was for a time the standard treatment for Mexican bean beetle) while if used on apples it has been known to cause serious leaf injury and even dropping of fruit. We commonly recommend hydrated lime as a safener for lead arsenate but lime is not compatible with fluorine compounds.

"Sulfur, applied either as a dust or a spray, may cause injury to the foliage of squashes, melons, and cucumbers, and to the fruits of raspberry, as well as to the tender growth and blossoms of roses and various other flowering plants.

"Many plants will not tolerate oil sprays, especially when repeated applications are necessary.

"Rotenone- and pyrethrum-containing sprays and dusts, are tolerated by most plants and rarely cause injury.

"Either sodium fluosilicate or barium fluosilicate, even when diluted with five times its weight of clay as for

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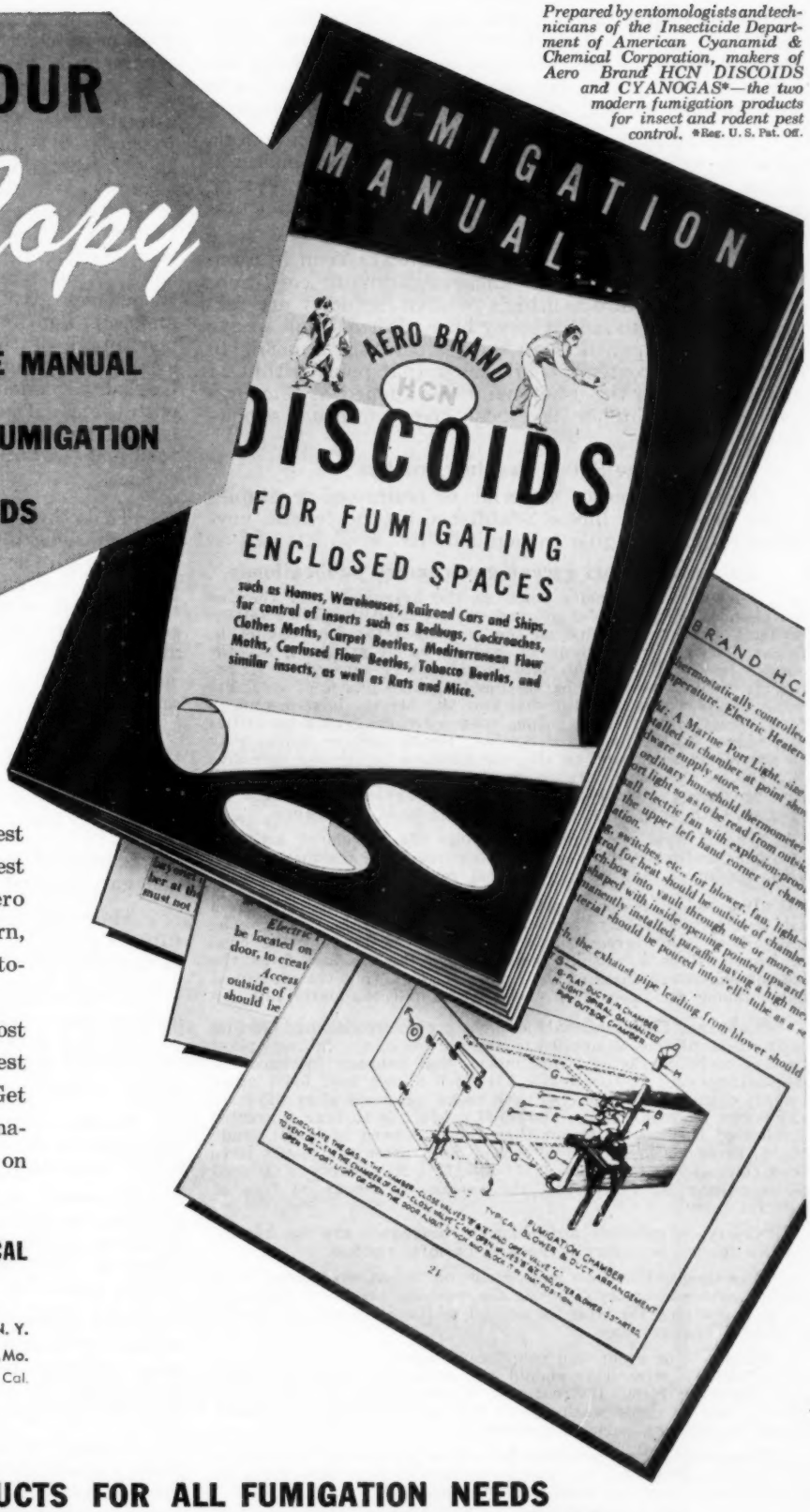
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control of blister beetles, will cause injury under some conditions, and many plants will not tolerate them. Cryolite applied at the recommended dosages is normally tolerated by most plants, but corn is particularly sensitive to this material as well as to other fluorine compounds.

Soap sprays, especially when used at high concentrations, will injure the leaves of such tender plants as young cabbage or cauliflower in seed beds, or garden peas and young beans, as well as many tender ornamental plants."

In the use of sprays we must always keep in mind the influence of weather conditions. Normally conditions of high temperature and high relative humidity are factors which tend to induce spray burn. Dormant oil sprays should not be applied when the temperature is below 40 to 45° F. or threatens to fall below that point within 24 to 48 hours. On the other hand oils applied at temperatures of 85° or higher have been known to cause serious injury.

The Spray Residue Problem

Residues of poison materials on fruits and vegetables above the present limits established by the federal government must be guarded against.

Quotations from recent government publications:

"Inorganic insecticides, such as the arsenicals and fluorine compounds, should not be sprayed or dusted on the edible foliage or fruit when the residue on the part used for food cannot be removed, either by washing or wiping, or by stripping off the outside leaves. These materials should not be applied to strawberries within 3 weeks of harvest, or to grapes and bramble fruits after the blossoms have opened and the berries have begun to form. Treatment after such time may leave dangerous quantities of residues on the harvested berries. Fruits such as apples may be washed in weak acid or alkaline solutions to remove excessive deposits. Unless they are to be washed in a manner that will remove excess amounts of insecticides, apples should not be sprayed with arsenicals or fluorine compounds after June.

"The Federal Government prohibits the movement and sale of apples and pears in interstate commerce when residues of lead, arsenious oxide, and fluorine exceed certain prescribed limits.

"Insecticidal residues cannot be removed satisfactorily from cabbage, lettuce, celery, spinach, cauliflower, turnip greens, kale, broccoli, or other greens by a superficial washing of the head or leaves. Such a washing may remove the residues from the outside smooth surfaces of the leaves or fruit, (but the innermost parts among the folds or ribs will not be affected materially.

"**Cabbage.** Such materials as paris green, cryolite, and calcium arsenate should not be applied to any portion of the cabbage plant that is to be marketed. This means that cabbage intended for marketing as U. S. Grade No. 1 (which allows four loose outer leaves) should not be sprayed with these materials after the head has begun to form. If the marketed product is to bear a greater number of loose outer leaves than those allowed in U. S. Grade No. 1, these materials should not be used after the plants have been thinned or transplanted. If all the outer leaves of headed cabbage have been removed, the remainder should be free of harmful rsidues.

"**Celery.**—Arsenicals and fluorine compounds are not recommended for use on celery because of harmful residue.

"**Tomatoes.**—Residues may occur on tomatoes treated with calcium arsenate or cryolite, but the washing process in the canneries and wiping the fruit for market with a cloth will practically eliminate these residues.

"**Beans.**—For green and snap beans, sprays or dusts containing cryolite or arsenicals should not be applied after the pods have begun to form. If treatment is made after this period of growth, two or three washings of the harvested beans in water should remove any harmful residues.

"**Peppers.**—All peppers that have been treated with an arsenical (calcium arsenate) or fluorine compound (cryolite) must be washed before they are marketed or processed."

Flowers and Ornamental Shubs

In the field of garden flowers and other ornamentals we must consider not only the danger of injury to various parts of the plant, but there is also the matter of spray deposits on foliage or blossoms which would disfigure them or at least detract from their appearance. After all, ornamentals are grown for ornamental purposes.

We also encounter the fact that there are numerous associations and societies of growers and many florist journals. In some cases the home grower is somewhat of a specialist in the particular field in which his pet "fad" belongs. When such individuals have problems, these problems are very often of a quite technical nature. Furthermore in the realm of ornamental pest control, there is a bewildering multiplicity of insecticides and fungicides. Almost all of these go by trade names which in themselves give no light on their physical or chemical make-up, and to make the matter more complex a large percentage of these are of foreign origin (many large estates are, or used to be, serviced by imported Scotch or English gardeners who brought their favorite concoctions with them). The situation probably is not as bad now as before the war, but sooner or later normal times will return and this may again constitute a complicating factor.

Plant Diseases

To do this subject justice, the matter of plant diseases warrants lengthy and detailed consideration not only in its own right but in its interrelation to insect attack. In this field, one must be able to recognize both the disease itself and its casual organism, and be in position to prescribe control measures based on the particular fungus and its seasonal development.

There is also the necessity of fitting the control program into the schedule for insect control, to save separate applications since in many cases both types of pests may occur simultaneously. This involves the matter of compatibility of fungicides and insecticides which is a complicated problem in itself.

Conclusions

The problems involved in insect pest control in fruits and gardens and ornamentals are many and complex.

They are further complicated by the intrusion of fungus diseases, with the necessity of controlling both in a combined program.

In many instances the margin between effectiveness against pests and the tolerance of the plants is very narrow so that great care should be given to the selection of suitable spray materials and to proper application under optimum weather conditions.

Success requires the ability to recognize not only all stages of the pests but also the characteristic damage which they do.

Materials must be selected which will not leave disfiguring deposits to mar the appearance of shrubs and blossoms, and in the case of fruits and vegetables proper materials must be used and correctly applied to avoid leaving poison residues on crops at harvest.

Pest control also involves the interrelation of different varieties of plants growing in the same neighborhood (Douglas fir and spruce in regard to spruce gall louse), and the significance of weedy growth nearby or along the margins of planted areas.

It should be kept in mind that in many cases owners possess quite extensive (often intensive) knowledge of the culture of plants and of the insect pests and plant diseases which attack them.

We must remember also that these folks have ways of finding out new developments so that, in very many cases, when problems arise on which they call for assist-

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The "Freon" Aerosol Bomb presented a new problem to manufacturers of pyrethrum extract. The first crude extracts developed for the Aerosol Bomb Program were unsatisfactory, because they contained too much material insoluble in "Freon." This insoluble material clogged the discharge tubes of the bombs, rendering them useless.

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Not until PYROCIDE 160 was developed 18 months ago was a wholly satisfactory pyrethrum extract produced for the Aerosol Program. PYROCIDE 160 uniformly contains less than 0.75% "Freon" insoluble material—LESS THAN 1/5 THE AMOUNT PERMITTED BY THE ARMY. To our knowledge, no other manufacturer has commercially produced so pure an extract up to this time.

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ance, these problems demand all the knowledge and experience of trained specialists (gardeners, arborists, etc.)

This is not a field which should be entered hurriedly and without due appreciation of the difficulties involved, and without a sufficient groundwork of knowledge to recognize the source of the trouble and to select safe and accurate measures of control.

There is no reason to believe, however, that, if this new type of enterprise is approached with due appreciation of the importance of the problems involved, and especially if the assistance of trained personnel is employed, this should not prove to be not only an interesting and attractive field of endeavor but also a profitable one. It should also give an added satisfaction from the knowledge that in this field of operation one is rendering a distinct and needed form of public service.

5th Eastern PCO Conference

BOWING TO WARTIME travel restrictions, continuity was maintained in the notable series of PCO Conferences held at Massachusetts State College, Amherst, Mass. The fifth annual gathering took place February 5, 6, and 7, with restricted registration; in other respects it was acclaimed the most successful program to date.

There were several innovations. An entire day was devoted to study of a single pest species—the roach. This policy of specialization was approved generally; men who have attended many conferences reported that never before have they learned so much about one insect. The roach had its day, and was thoroughly explored. Laboratory exercises and demonstrations covered (a) structure and classification, (b) identification by types of damage, excreta, etc., (c) control by chemical methods, (d) correct application of powder insecticides. Discussion leaders were: Philip H. Mayer, theory of stomach and contact insecticides; Rouben Davidson, liquid insecticides; Fred J. Bowers, fumigants; J. Edwin Sameth and H. L. Sweetman, powders; D. P. McAlindin, pastes. Original testing equipment, including dusting tower and fumigant chamber, was introduced. A realistic powder application was conducted by John K. Medoff.

A "faculty exchange" arrangement, which may well become established policy, permitted attendance of Father O. Fournier, University of Montreal, who brought inspiration and instruction. Professor Sweetman, M.S.C., will in turn participate in the Canadian PCO Conference at Montreal.

Special interest was displayed in presentations by Charles Pomerantz, "Pitfalls of a Tick Job"; Ernest M. Mills, "Library Science"; Prof. Arthur I. Bourne, "Pests Outside the Four Walls"; C. A. Vincent-Daviss, "What the Technical Man Is Discovering About Surfaces".

Other sessions were devoted to Fumigation Problems, Rodent Control, and DDT Developments. More industry members than ever filled instructor assignments. The U. S. Fish and Wildlife Service was represented by George B. Lay, Ernest M. Mills and Robert M. Borg. The College conference faculty included Prof. Charles P. Alexander, Prof. Arthur I. Bourne, Prof. Harvey L. Sweetman, Dr. Marion E. Smith and Mr. William B. Becker.

Guest speaker at the banquet, held at the Lord Jeffrey Inn, was Professor Albert E. Waugh, University of Connecticut, who spoke on "An Economist Looks at the War". President Hugh P. Baker, M.S.C., served as toastmaster, and announced that the PCO Student Loan Fund had reached one thousand dollars.

The Health Board and Pest Control Operators

By **JOHN L. PORTER**, ***Assistant Director, Division of Public Health Engineering, Louisiana State Board of Health***

Editor's Note: This paper was read at the Fifth Southern Pest Control Operators' Conference held at Louisiana State University, Baton Rouge, La., December 4-6, 1944.

WHEN DR. ROSEWALL invited our office to present a paper before this Conference on the subject announced on your program it did not appear to be a subject about which very much could be said.

Health officials have had very little opportunity for contact with pest control operators in the past; and Pest Control Operators have equally little opportunity or reason for contacting Health Departments.

This has been due very largely to the fact that the interest and activities of pest control operators have been, and in fact still are, centered in work having for its purpose the destruction of pests affecting man's economic welfare; with relatively little attention being paid to his physical comfort and health. In fact, the only contact between the pest control operators with any official or governmental agency has been in connection with regulations relating to the safety features involved in the use of various toxic materials.

Further consideration of the subject has led us to the belief, however, that there could be much mutual advantage in a closer relationship between the Pest Control Operators and Health Officials.

Boards of Health have long recognized the relation between various pests and the comfort and health of mankind, and have sponsored, supervised, and in some cases, operated projects having for their purpose the elimination or control of some of these pests.

With the advent of war, and the concentration of large groups of people in military and war industry establishments, the interest in all health activities has been quickened; more especially in the control of disease carrying pests, whether they be insect or animal.

The Louisiana State Board of Health welcomes this opportunity of bringing some phases of pest control to the attention of the Pest Control Operators of the South, and to bespeak their serious consideration of the possibilities for them to participate in these activities in a practical way, which will not only benefit the health of the citizens of the communities in which they operate; but may be also a source of expanded business and profit to themselves.

It is not my purpose at this time to enumerate all of the different pests which are directly or indirectly the cause of disease in man, since that subject was presented by me in a paper before a previous meeting of this group.

My remarks will be confined, therefore, to consideration of those pests which health officials have considered susceptible of elimination or control by physical means, under the broad concept of "Environmental Sanitation", and in the control of which your group may well have more than an academic interest.

Among the special activities which appear to be within the province of pest control operators are all

phases of rat control, including poisoning, trapping, rat proofing of structures and vent stoppage; and mosquito control.

It is probable that these activities cannot be taken up to a very large extent until after the war. However, much can be accomplished in the way of studying the problems, and planning for future activities. In this connection much valuable information may be obtained from local, state and federal health authorities.

I would like to go into some detail regarding the two items just mentioned. First, let us consider rat control, or rodent control as it is more generally called. The rat has frequently been called "Public Enemy Number 1." Not only does he destroy or damage an enormous amount of food—variously estimated at from two dollars to twenty dollars per capita per year—but either directly or indirectly is the carrier of three important diseases: viz, The dread Bubonic Plague which visited New Orleans in 1914, and in several subsequent years, rat bite fever, and endemic typhus fever. The latter disease has been steadily increasing throughout the South in recent years, and merits the serious consideration of all who are interested in the health of our people. As previously mentioned, health officials have been very active in pointing out the danger to the public health caused by rats and in promoting the elimination or control of rats by various known means.

Authorities have recognized that trapping and poisoning of rats alone, even when carried on continuously, which is very costly, is not completely effective; but must be accompanied by the rat proofing and vent stoppage of buildings, and the safe-guarding of all food materials. Nor, is rat-proofing alone sufficient to eliminate or keep down the rat population. The two phases of rat control must be carried on together and the rat-proofing and

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Nov. 20, 1944

Mr. Henry Turrie
522 W. North Ave.
Milwaukee 12, Wis.

Dear Mr. Turrie:

We certainly enjoyed hearing and seeing your most interesting and educational presentation on insect and rodent control, at the 11th quarterly meeting of the Lake Shore Plumbing and Sanitary Inspectors Association, at Kenosha on November 18, 1944. The silent film, and your comments which accompany it have a great deal of human appeal. Medical Entomology is a new and rapidly growing science, and we can't know too much about it. Rodent control is an economic and health necessity. We were impressed with your statement that there should be better understanding between public health workers and the workers engaged in the field of commercial extermination. Your exhibit on how pests endanger your health and comfort reflects an intelligmet understanding of this important economic and health problem. Pictures speak a multitude of languages. Visual memories are always more lasting than word memories. Your exhibit will accomplish much in ghis educational field.

We carried away much valuable information on the subject of pest control, and we both hope that we can, in the near future, see the picture and listen to your interesting annotations.

Respectfully yours,

H. J. Burger
H. J. Burger
Sanitary Inspector
Janesville, Wisconsin

Fred. B. Welch
Fred B. Welch, M.D.
Health Commissioner
Janesville, Wisconsin

FBW/l

The above is one of many comments we received after showing the film and educational photographs. This lead to many additional requests.

Health Commissioners, Sanitary and Food Inspectors, Real Estate Boards, Grocery and Food Associations, Farm Groups, Business and Social Clubs, Schools and Churches, in your town and state are anxiously awaiting the opportunity to see this film.

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vent stoppage must be maintained, and trapping or poisoning must be repeated when reinfestation is indicated.

In order that effective control might be ensured, health and municipal authorities have set up and operated rodent control projects which include both the reduction of the rat population and the rat proofing of buildings in a considerable number of cities and towns. In general, the construction work necessary for effective rat proofing and vent stoppage is being carried on with labor and materials furnished by the city or health department, and billed against the property owners. This method of rodent control by city and health authorities is not the result of any desire on their part to embark in the construction or extermination business, but because other means of attaining the desired end have not been available. Health menaces such as faulty plumbing, insanitary food handling establishments, dairies, etc., when found to exist by routine inspections of sanitary officers, are not corrected by the health department. The owner or operator is notified to have the plumbing corrected by a competent plumber and to have any other needed corrections made by competent mechanics. Health authorities would welcome the opportunity to recommend to property owners competent and skilled organizations or companies who could and would contract to undertake rodent control operations at reasonable prices.

This activity would seem a most logical one for pest control operators to assume—one which is not radically different from some, at least, of their present activities. Men who are skilled in construction methods used in termite proofing could readily adapt their knowledge to rat proofing and vent stoppage techniques. Poisoning and trapping are activities with which most pest control operators are familiar, and which are carried on to some extent by many. The argument which has been advanced by some authorities that pest control operators are not familiar with rodent control methods and are unprepared, therefore, to undertake such work, is not, in my opinion, a valid one. Anyone, embarking in a new enterprise does so only after some investigation and study of its requirements. There are numerous ordinances, regulations and specifications available covering all phases of rodent control; and health officials stand ready and willing to advise and assist whenever they are asked.

I cannot but feel that, with the increasing incidence of endemic typhus fever and the educational work being carried on by health authorities throughout the South, there will be a golden opportunity for those who are ready to seize it when construction materials are freely obtainable.

The other important health activity in which pest control operators can and should participate is mosquito control. Mosquitoes are the known carriers of many diseases; the most important of which at the present time, is the one which transmits malaria. Malaria mosquito control by the elimination of favorable breeding places, by larviciding, that is treating the surface of standing water with oil or other chemicals which kill the mosquitoes while still in the larval stage, has been practiced for many years by federal and local health authorities; and it is believed to be a considerable factor in reducing malaria incidence to its present low level. There is still a considerable amount of malaria in the Southern States. Some estimates place the number of cases per year at three hundred thousand.

With the advent of war and the establishment of military camps and war industry plants throughout the South, the War and Navy medical departments and the United States Public Health Service recognized the potential danger of malaria transmission to the thousands of men crowded together in malarious areas. To provide protection for these men there was set up a project known as "Malaria Control in War Areas," operated by the State Boards of Health with Federal funds furnished through the United States Public Health Service. These projects operate in areas surrounding military reservations and war industry establishments.

As a result of these protective measures there has been remarkably little malaria among the inductees or war workers.

The control measures carried on under this project have been aimed at control of breeding only, by means of drainage, larviciding, etc. This method of mosquito control, while relatively costly, is economically feasible in limited areas. It would not be possible, however, to control breeding in all of the favorable malaria mosquito breeding places throughout the malarious areas of the South.

More recently, various governmental health agencies have become quite concerned over the possibility of civilian populations becoming infected by returning military personnel who may be carriers of malaria.

Recognizing the limitations of larval mosquito control, various governmental agencies have been investigating and testing various chemical products which might be effective against the adult mosquito. One of the products investigated has been found to possess outstanding merit as an insecticide, particularly against mosquitoes, and to have a very considerable residual effect.

As a result of this discovery the United States Public Health Service is planning to extend the Malaria Control in War Areas program to include the spraying of the interior of all houses in rural areas in the more malarious parts of the selected group of states with this chemical.

Observation of the effect of these spraying operations which have been carried on in upwards of one thousand houses, indicates that the residual killing effect lasts for several months. Since an appreciable number of returning military personnel are expected to be malaria carriers, and since these men will presumably return to their homes scattered throughout the country, the merit of this method of prevention of the transmission of malaria to their families and neighbors is very apparent.

This initial project covers but a small part of the United States and there wil be, therefore, a tremendous opportunity for private agencies to engage in this activity as soon as the essential chemical product becomes available for civilian use.

Here again would appear a golden opportunity for this group to participate in an essential health activity; and again health agencies will be ready and willing to assist with all their available knowledge and experience.

The Entomologists' Joke-Book

There are so many new faces in our membership that we felt it timely to refer to the fact that there may still be procured copies of this splendid book of humorous writings and comments . . . unwittingly written . . . of an otherwise highly important science. The preparation of this book was done by Professor J. J. Davis, who has carefully compiled and selected much interesting material. This book may be purchased for $1.00 plus 10 cents in stamps to cover mailing postage. No PCO should be without this book in his library. Also order now before you forget—very simple to enclose a $1.00 bill and 10c in stamps.

This will make an excellent gift to PCO's in service and others.

ortho-DICHLOROBENZENE AS AN INSECTICIDE

By **FRED W. FLETCHER,** ***Biochemical Research Laboratory, Dow Chemical Company, Midland, Michigan***

Editor's Note: This paper was delivered at the 12th Annual Meeting of the National Pest Control Association, Chicago, Illinois, October 25, 1945.

ALTHOUGH ortho-dichlorobenzene (1,2-dichlorobenzene) has been known for 30 years to have insecticidal properties, it is not as well known as para-dichlorobenzene as an insecticide. This fact is largely due to differences in physical properties and also to published reports implying greater cost. In comparison with p-dichlorobenzene, the ortho-isomer seems to have equal or even greater toxicity to certain insects. Due to lack of readily available information regarding the insecticidal uses of o-dichlorobenzene, the following literature survey was compiled. This survey includes a brief historical review, information on the chemical, physical, and toxicological properties, as well as a review of the uses and insecticidal effectiveness of o-dichlorobenzene against various insect pests. It is hoped that this review will stimulate interest in a wider application of this readily available and comparatively cheap insecticide.

Historical Review

The insecticidal properties of ortho-dichlorobenzene were reported as early as 1914, in a British patent, No. 10,379 (153). The development of this compound as an insecticide did not begin, however, until 1920 when Tattersfield and Roberts (141) tested it with fair success as a soil fumigant for the control of wireworms. During that same year, 1920, Hailer (65) found o-dichlorobenzene to be quite effective as a fumigant for the control of body lice on clothing. Freshly cut logs were protected against powder-post beetle attack by a spray containing o- and p-dichlorobenzene (anonymous, 1921) (3). In 1921 Gardner (57) used a mixture of o- and p-dichlorobenzene as a paint thinner and found this paint quite toxic to cockroaches. Mengel in 1922, German patent No. 343,866 (154), claimed o-dichlorobenzene as a carrier and solvent for other insecticidal toxicants. The idea of using o-dichlorobenzene as a household fumigant was suggested by Roughley and Welsh in 1923 (116). The first use of this compound as a constituent of contact insecticides for the control of plant feeding insect pests was suggested in 1924 in a German patent, No. 384,157 (165). In 1924, Snyder (124) found this chemical effective as a poison for termites in wood, and he also recommended its use as a soil fumigant for controlling these pests around basement walls. Neifert, et al., in 1925 (104) found o-dichlorobenzene not especially toxic against grain pests in laboratory tests. As a treatment for controlling wood borers in the branches of clove trees, Corbett in 1925 (36) discovered o-dichlorobenzene to be very effective. The effective treatment of sewage with o-dichlorobenzene for the control of the trickling filter fly was accomplished in 1933 by Kemper (84) and Simpson (121). Ortho-dichlorobenzene increased the effectiveness of carbon bisulfide as an herbicide according to Missbach in 1939 in U. S. patent No. 2,156,789 (163). Aquatic midges were controlled in 1940 and 1941 by Felton (50 and 51) by the treatment of infested waters with o-dichlorobenzene. One of the most outstanding developments was that of Goodhue and Sullivan in 1941 (63), when they used o-dichlorobenzene as an insecticidal aerosol for effective control of many household and stored product insect pests.

PHYSICAL AND CHEMICAL PROPERTIES OF ORTHO-DICHLOROBENZENE

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fied grade, and the technical grade, which contains 90% of the ortho- and 10% of the para- isomer. The technical grade is the only grade used for insecticidal purposes and has the following properties:

Weight/gallon ..... 10.8 lbs. at 20°C.=68°F.
Flash point ..... 73°C.=164°F.
Burning point ..... 138°C.=280°F.
Specific heat ..... 0.27 cal./g. or BTU/lb. at 0-100°F.
Heat of vaporization ..... 66.4 cal./g. or 119.5 BTU/lb. at boiling point

Miscible with most organic solvents, such as carbon tetrachloride, carbon bisulphide, monochlorbenzene, tetrachlorethane, ethylene dichloride, tetrachlorethylene, chloroform, alcohol and ether; insoluble in water.

SPECIFICATIONS: Contains approximately 90% ortho-dichlorobenzene and 10% para-dichlorobenzene.

Specific gravity ..... 1.304 at 20/4.C.
Boiling point ..... 179°C.=354°F.
Boiling range ..... 4°C.
Freezing point ..... —21.5°C.=6.7°F.

Ortho-Dichlorobenzene offers no special fire hazard, although it burns readily when ignited.

TOXICOLOGICAL PROPERTIES OF ORTHO-DICHLOROBENZENE

There is no adequate information available concerning the vapor toxicity of o-dichlorobenzene. In much of the work that has been reported (168) there has been no attempt to use pure o-dichlorobenzene, but rather mixtures containing benzene, monochlorobenzene, o- and p-dichlorobenzene, trichlorobenzene, and tetrachlorobenzene have been used. Even Sameron (169,170), who has probably made the most extensive investigations that have been published so far, used a mixture containing only 48.8% o-dichlorobenzene. However, judging from the best information available, it is probable that o-dichlorobenzene neither produces blood changes comparable to those commonly found in benzene poisoning, nor as marked liver degeneration as CCl_4. It is believed that men can tolerate repeated exposures to the concentrations of o-dichlorobenzene of the order of 100 p.p.m. without serious ill effects, and that short single exposures to concentrations up to 1000 p.p.m. should not prove hazardous.

REVIEW OF THE INSECTICIDAL LITERATURE ON O-DICHLOROBENZENE

For the purpose of brevity, the insecticidal literature on o-dichlorobenzene has been summarized in the following table, which gives the pest, the best method of control, general remarks, and literature reference numbers. This survey was made as complete as possible; however, there are undoubtedly some references that have been missed. From the practical standpoint this review covers all the main insecticidal uses of this compound.

TABLE SUMMARIZING THE LITERATURE ON THE USES OF ORTHO-DICHLOROBENZENE AS AN INSECTICIDE

PEST	METHOD OF CONTROL	REMARKS	REFERENCES
	A. For Treatment of Insect Pests of Seasoned Wood.		
Powder post beetles, belonging to families Lyctidae Ptinidae Anobiidae	Spray or brush infested wood with o-dichlorobenzene either alone or mixed with fuel oil (1:8). The addition of 6 oz. of naphthalene increases the toxicity of this mixture and is particularly suitable for treating logs. An English formula for treating wood in old buildings consists of o-dichlorobenzene 50%, kerosene 47%, and barium oleate 3%.	Since o-dichlorobenzene is a good solvent it will remove the finish of furniture, etc. Two gal. of material will saturate approximately 100 sq. ft. of wood surface.	1, 3, 4, 7, 16, 2[illegible] 31, 44, 52, 53, 5[illegible] 58, 64, 77, 86, 9[illegible] 99, 117, 125, 13[illegible] 133, and 146
Queensland Pine Beetle, **Araucaria cunninghami**	Treat infested seasoned wood with a 5 to 10% solution of o-dichlorobenzene in kerosene.	Not a permanent treatment but it penetrates well.	25
Wood borers (in general)	Spray infested wood with o-dichlorobenzene alone or a 5 to 10% solution in kerosene. o-Dichlorobenzene also used in combination with p-dichlorobenzene and sometimes with glue.	o-Dichlorobenzene often used as a standard insecticide for comparing other compounds in laboratory tests against wood borers.	15, 24, 30, 55, 7[illegible] 106, 116, and 13[illegible]
Dry-wood termites, **Kalotermes** sp.	If impossible to remove infested timbers saturate them with o-dichlorobenzene.	o-Dichlorobenzene gives satisfactory control of dry-wood termites; however, it is not permanent.	88, 90, 91, 12[illegible] 126, 130, and 16[illegible]
Carpenter bee, **Xylocopa latipes** Dru.	Paint infested wood with fuel oil thinned with kerosene and o-dichlorobenzene.	When tunnels become saturated they should be plugged with putty, caulking compound, etc.	20
Carpenter ants, **Camponotus** sp.	Baits containing o-dichlorobenzene.	Treatments unsatisfactory.	56
PEST	METHOD OF CONTROL	REMARKS	REFERENCES
	B. For Treatment of Borers in Living Trees or Freshly Cut Logs.		
Smaller European bark beetle, **Scolytus multistriatus** Marsh. Family Scolytidae.	Spray with o-dichlorobenzene 1 part (by vol.) in 4 parts of fuel oil.	This spray is not only toxic but also repellent to this pest giving protection for one season.	2, 34, 136, 13[illegible] and 151
Native elm bark beetle, **Hylurgopinus rufipes.** Family Scolytidae.	Spray with o-dichlorobenzene 1 part (by vol.) in 4 parts of fuel oil.	This spray is not only toxic but also repellent to this pest giving protection for one season.	34
Mountain pine beetle, **Dendroctonus monticoli** Hop. Family Scolytidae.	Spray logs and stems of standing trees with o-dichlorobenzene 1 part (by vol.) in 4 parts of diesel oil.	This treatment reduces labor requirements and eliminates the hazardous burning method.	11, 47, and 59
Locust borer, **Cyllene robiniae** Forst. Family Cerambycidae.	o-Dichlorobenzene was used at the rate of 1 gal. to 1 gal. of H_2O and emulsified by 1 lb. of whale oil soap. This stock emulsion was diluted with H_2O 1 to 6 before spraying infested trunks and limbs.	This emulsion was very effective giving 98% control, and caused no injury to trees.	66, 68, 72, and 13[illegible]
Flat-headed wood borers. Family Cerambycidae.	Spray with o-dichlorobenzene 1 part (by vol.) in 4 parts of fuel oil.	This spray is not only toxic but also repellent to these pests giving protection for one season.	136
Flat-headed wood borers. Family Cerambycidae.	Inject o-dichlorobenzene into the galleries of the wood borers.	Control was effective in the branches of clove trees.	36
Round-headed wood borers, **Capnodis tenebrionis** L. Family Buprestidae.	Roots of infested nursery trees were dipped in a strong emulsion of mineral oil containing o-dichlorobenzene.	Penetration was not sufficient to kill all of the larvae in their mines.	114
Wood borers (in general)	Injection of o-dichlorobenzene into the sap stream.	Control with this compound as with all others was ineffective.	37

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PESTS	METHOD OF CONTROL	REMARKS	REFERENC
Subterranean termites. **Reticulitermes flavipes** (Kollar) **Aritermes** sp. **Heterotermes** sp.	**C. As a Soil Fumigant.** Apply o-dichlorobenzene along foundation walls in a trench 30" deep in the case of complete excavation or 10" deep along shallow footings. The bottom of the trench should be drenched as well as the soil as it is replaced in the trench. One to 2 gal. of poison must be used per 10 linear feet of trench. A mixture of 1 pt. of o-dichlorobenzene to 3 pts. of light fuel oil is also effective, but 2.5 to 5 gal. per linear ft. of trench is necessary. One of the best mixtures consists of o-dichlorobenzene 1 pt., coal tar creosote 1 pt., and light fuel oil 6 pts.	ortho-Dichlorobenzene is injurious to the roots of trees and shrubs so care must be taken in applying it. May also be applied along foundation walls in holes 30 inches deep and 15 inches apart made with a crowbar.	9, 10, 12, 15, 19, 43, 71, 74, 94, 95, 97, 118, 122, 126, 128, 129, 130, 145
Sugar cane grubs. **Lepidiota frenchi** Blkb., **Lepidiota trichosterna** Lea, **Pseudoholophylla furfuracea** Burm., **Lepidoderma albohirtum** Waterh. Family Scarabaeidae.	Treat soil with o-dichlorobenzene 1 part and CS_2 2 parts. Two injections should be made to a depth of 4", one on either side of a cane stool. Three to 4 injections may be necessary for large stools.	Good control of the grubs was secured but o-dichlorobenzene injured cane stools.	21, 28, 67, 82, 101, 102, and
Chaffer beetle, **Phyllopertha horticola** L. Family Scarabaeidae.	Soil treated with emulsions containing 1.28% o-dichlorobenzene.	100% of the grubs were killed but severe damage to grass resulted.	22
White grubs, **Polyphylla fullo** L., **Melolontha hippocastani**, Family Scarabaeidae.	The dosage of polychlorides recommended was 0.7 to 1.0 oz. placed in holes 28" apart and 8" deep in soil. This amounts to 375 to 490 lbs./acre.	Good results were secured although in some cases plant injury resulted. The polychlorides consisted of o-, m-, and p-dichlorobenzenes.	33, 61, 62, 87, 88 (All Russ references)

PEST	METHOD OF CONTROL	REMARKS	REFERENC
White grubs in general. Family Scarabaeidae.	Soil was treated with o-dichlorobenzene alone and in oil emulsions.	Satisfactory grub control and injury to some crops, especially corn, resulted from its use.	35, 41, 49, and
Wireworms, **Lacon variabeles** Cand. and other species. Family Eleteridae.	o-Dichlorobenzene used alone and in combination with the para-isomer. Applied in the plow furrow.	o-Dichlorobenzene has only moderate toxicity to wireworms, and the residual effects in the soil are objectionable to sugar beets, sugar cane.	89, 96, 141, a 143
Alfalfa snout beetle, **Otiorrhynchus ligustici** L. Family Curculionidae.	o-Dichlorobenzene was applied in holes 15" apart in staggered rows 15" apart. Immediately after application each hole was filled with soil which was then tamped and sealed with one-half pint of water.	o-Dichlorobenzene could not be relied on to give complete control of the larvae or adults. Also caused injury to alfalfa.	119
Turnip flea beetle, **Phyllotrita nemoricus**. Family Chrysomelirdae.	A mixture of o- and p-dichlorobenzene in sand was applied to the soil.	Good control was secured.	98
Leather jackets, **Tipula paludosa** Meig. Crane fly larvae. Family Tipulidae.	The emulsion recommended for treating the soil was o-dichlorobenzene 16 pts. (by vol.), 4 pts. of sodium oleate and 5 pts. Jeyes' fluid. This stock emulsion was diluted 1:400 with water and applied at the rate of 1 gal. per sq. yd. of turf.	Very little injury to sod resulted. These emulsions drive the leather jackets to the surface of the soil. These emulsions are sometimes used to determine the effectiveness of various treatments.	17, 18, 39, 40, 92, and 149
Fever-fly, **Diplophus febrilis** L. Family Bibionidae.	The emulsion recommended for treating the soil was o-dichlorobenzene 16 pts. (by vol.), 4 pts. of sodium oleate and 5 pts. Jeyes' fluid. This stock emulsion was diluted 1:400 with water and applied at the rate of 1 gal. per sq. yd. of turf.	About 75% mortality was secured.	39 and 42

PEST	METHOD OF CONTROL	REMARKS	REFERENC
Cabbage maggot, **Hylemyia brassicae** Bouche'. Family Anthomyiidae.	A mixture of o- and p-dichlorobenzene in sand was applied to the soil.	Good control was secured.	98
Carrot rust fly, **Psila rosae** Fabr. Family Psilidae.	A proprietary product containing o- and p-dichlorobenzene was applied to the soil.	This material acted as a repellent to the carrot rust fly.	32
Housefly, **Musca domestica** L. Family Muscidae.	Polychlorides (a mixture of o-, m-, and p-dichlorobenzene) were applied in holes or poured over the surface of the soil.	They were effective but not reliable even at high dosages. It was considered that they would be of value in controlling fly pupae used at the rate of 3 oz. per sq. yd. Such a treatment should be useful on dumps and other places where flies breed.	45
Grape phylloxera, **Phylloxera vitifoliae** Fich. Family Phylloxeridae.	Polychlorides (mixture of o-, m-, and p-dichlorobenzenes) were applied at the rate of 1.2 oz. per sq. yd.	Almost complete kill of the aphids was secured in the upper soil layers.	113
Mealy bug, **Pseudococcus brevepes** Chel. Family Coccidae.	o-Dichlorobenzene was applied to the soil at the rate of 2 to 10 cc. per plant.	Good control of mealy bugs on the roots of Phoenix sp. was secured.	76

(Continued on page 20)

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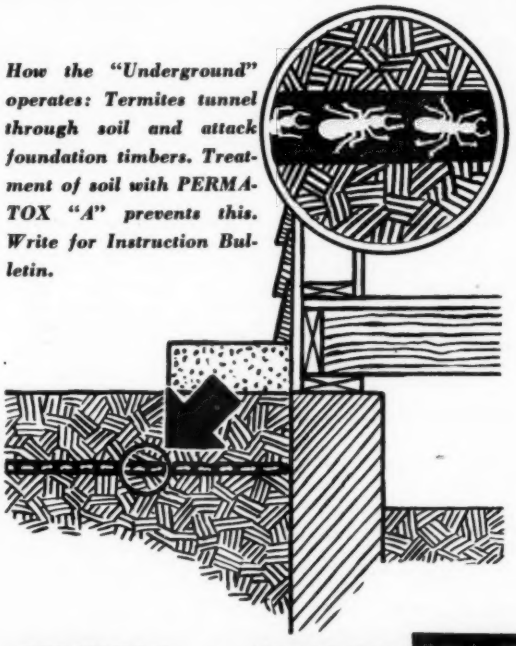

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Peach borer, **Canopia exitiosa** (Say). Family Aegeriidae (Lepidoptera).	Applied to the soil.	o-Dichlorobenzene not as safe on peach trees as p-dichlorobenzene.	111, 113, and 123
Nematodes (in general).	Applied in combination with $Ca(CN)_2$.	o-Dichlorobenzene was not a good substitute for p-dichlorobenzene. Poorer nematode control and more injury to tomato plants resulted.	83

PESTS	METHOD OF CONTROL	REMARKS	REFERENCES
Bursate nematodes of horses and sheep.	Applied to the soil and feces of horses and sheep.	o-Dichlorobenzene will sterilize about 400 times its weight of feces against the free living stages of Sclerostomes when the feces were treated before the eggs could develop.	107
Trickling filter fly, **Psychoda alternata.** Family Psychodidae.	**D. For Sewage Treatment.** Ten p.p.m. of o-dichlorobenzene is added to sewage influent once a week.	Up to 10 p.p.m. of this material gave good control and has no apparent effect on filter efficiencies. o-Dichlorobenzene is also an efficient weed eradicator for filter beds.	46, 48, 85, 121, and 144
Aquatic midges. **Chironomus** spp. **Proclodius** spp. Family Chironomidae.	**E. For Aquatic Midges.** o-Dichlorobenzene was sprayed on the surface of water at the rate of 21 to 25 gal. per acre.	Effective control was obtained.	50 and 51
Bedbug, **Cimex lectularius** L. Family Cimicidae.	**F. For Use Against Household Pests.** Several formulae have been used successfully: o-Dichlorobenzene, 2 gal.; Kerosene, 50 gal.; Methyl salicylate, 1 gal., applied as a spray. o-Dichlorobenzene 50%, CCl_4 50%, applied as a spray. o-Dichlorobenzene 50%, Oil 50%, applied as a spray.	o-Dichlorobenzene is a very effective material against bedbugs; however, its odor is very persistent. It was formerly used as a household fumigant in England but due to alleged toxic properties its use in inhabited buildings has been discontinued. It is still used, however, in leaky uninhabited houses, especially prior to demolition.	6, 8, 13, 29, 69, 79, 80, and 109

PESTS	METHOD OF CONTROL	REMARKS	REFERENCES
Clothes moths. Family Tineidae.	Used alone or in admixture with p-dichlorobenzene.	An effective fumigant for the control of clothes moths in confined spaces.	27, 106, 147, and 153
Ants. Family Formicidae.	Inject a tablespoonful of o-dichlorobenzene in openings and close with putty or plastic wood. Make injections through all possible openings.	Recommended for ants that nest in woodwork.	14
Chloropid flies, **Chloropisca circumdata** Meig. Family Chloropidae.	Flies controlled by daily spraying of houses with o-dichlorobenzene at the time of the maximum swarming.	The odor of this chemical is considered objectionable and is readily absorbed by certain foods, particularly milk.	84
Fleabettles, **Phylloptreta** spp. Family Chrysomelidae.	**G. For the Control of Agricultural Pests.** A mixture of slate dust 5 lbs. and o-dichlorobenzene 1 oz., applied as a dust at the rate of 100 lbs. per acre.	The population of fleabeetles was reduced from 88% to 6% by this treatment.	38
Fleabeetles in general. Family Chrysomelidae.	Seeds were given a seed dressing of orthodichlorobenzene.	Treated seeds of swede, turnips and crucifers were not repellent to fleabeetles and germination was not affected.	38 and 148
Bean aphis, **Aphis rumicis.** Family Aphididae, order Homoptera. **Selenia tetralunaria**, order Lepidoptera.	Sprays containing chlorobenzenes were applied in laboratory tests.	The order of toxicity of the chlorobenzenes was mono — p-dichloro — o-dichloro — trichloro. 100% of the aphids were killed by a spray containing 4% o-dichlorobenzene and a spray containing 5% of this compound was not effective against the egg of **S. tetralunaria.**	140

PESTS	METHOD OF CONTROL	REMARKS	REFERENCES
Codling moth larvae, **Carpocapsa pomonella** L. Family Tortricidae.	A 1% o-dichlorobenzene spray was applied to codling moth larvae on bark in the laboratory.	75% of the larvae were killed.	60
Codling moth larvae, **Carpocapsa pomonella** L. Family Tortricidae.	Codling moth bands for controlling the overwintering larvae were impregnated with b-naphthol and o-dichlorobenzene.	Gave indications of having practical value.	54
Citrus thrips, **Scirtothrips cetri** (Moult.), Family Thripidae.	Sprays containing kerosene and o-dichlorobenzene were applied to lemons and oranges.	The control of citrus thrips was unsuccessful.	110
European red mite, **Paratetranychus pilosus** (C and F). Order Acarina, family Tetranychidae.	Experiments were conducted with dichlorobenzene and 100% "Standard A" (a proprietary coal tar distillate product) for the control of red spider eggs.	Only 17% mortality of the eggs was obtained.	93
Miscellaneous insects	**H. As a Constituent of Fumigating Paints.** o-Dichlorobenzene used in admixture with paints.	Useful for controlling pests in stables, chicken houses, granaries, etc.	57, 131, and 160

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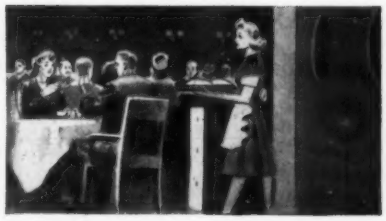

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Confused flour beetle, **Tribolium confusum**, Duv. fam. Tenebrionidae. Indian meal moth, **Plodia interpunctella** (Hbn), fam. Pyralididae. Granary weevil, **Sitophilus granaria** (L.), fam. Curculionidae. Rice weevil, **Sitophilus oryza** (L.), fam. Curculionidae.	**I. For Use Against Grain Insects.**		67 and 104
	o-Dichlorobenzene alone and in combination with p-dichlorobenzene as fumigants.	o-Dichlorobenzene is quite toxic to grain insect pests but causes pork to taste after hogs feed on treated grain.	

PESTS	METHOD OF CONTROL	REMARKS	REFERENCES
Granary weevil **Sitophilus granarius** (L.), Fam. Curculionidae. Confused flour beetle, **Tribolium confusum**, Duv. family Tenebrionidae.	Grain insects were dipped for a moment in tank-mix emulsions prepared from solar oil 1-5%, soap 0.1 to 0.2% and polychlorides (mix of o-, m-, and p-dichlorobenzenes).	These tests demonstrated that this emulsion may be effectively used in empty bins infested with grain pests.	120
Body lice, **Pediculus humanus carporis** DeG. Family Pediculidae.	**J. For Use Against Pests of Man and Animals.** o-Dichlorobenzene as a fumigant.	o-Dichlorobenzene effective as a fumigant for body lice on clothing in tests conducted in closed containers.	65
Green-bottle flies, **Lucilia sericata** Meig. Family Muscidae.	o-Dichlorobenzene applied at a concentration of 0.9% on sheep.	o-Dichlorobenzene was not repellent to **L. sericata** oviposition on sheep.	73
Animal parasites in general.	o-Diehlorobenzene as a carrier for a parasite destroying material to be applied on animals.	o-Dichlorobenzene aids in penetration and adherence.	154
	K. For Use as a Weed Killer.		46 and 163
	A soil fumigant and weed killer consisting of CS_2 containing 10% or less of o-dichlorobenzene.	o-Dichlorobenzene in this mixture increased plant injury as well as persistency.	

PESTS	METHOD OF CONTROL	REMARKS	REFERENCES
Housefly, **Musca domestica**, fam. Muscidae; American cockroach, **Pariplaneta americana** (L.), fam. Blattidae; German cockroach, **Blattella germanica** (L.), **fam. Blattidae**; Carpet beetle larvae, several spp., fam. Dermestidae; confused flour beetles, **Tribolium confusum**, Duv., fam. Tenebrionidae; crickets, several spp., fam. Grillidae; bedbugs, **Cimex lectularius** L., fam. Cimicidae.	**L. For Use in Insecticidal Aerosols.** o-Dichlorobenzene was applied as an insecticide in aerosol form in combination with various synergists, such as lauric acid, oleic acid, salicylic acid, and several others.	o-Dichlorobenzene in aerosol form along with synergists is very effective against insect pests, at concentration as low as 1.5 lbs. of o-dichlorobenzene and containing 5% synergist per 1000 cu. ft.	63, 138, 139, 164 165, 166, and 167
Various insect pests	**M. General and Miscellaneous Uses of Ortho-Dichlorobenzene as an Insecticide and Fumigant.** Used in sprays, dusts, and as a fumigant, both alone and in mixture with other material.	General and miscellaneous references referring to o-dichlorobenzene as a fumigant, a general insecticide, a solvent or carrier for other insecticidal toxicants, etc.	16, 26, 55, 67, 81, 97, 106, 108, 109, 115, 155, 156, 157, 158, 159, and 161

SUMMARY

A review of the insecticidal literature reveals that o-dichlorobenzene is particularly useful for the control of powder post beetles in seasoned wood. It is also efficacious for the treatment of branches and trunks of trees infested with bark beetles. As a soil fumigant, o-dichlorobenzene has been used successfully for the control of subterranean termites around basement walls. This compound has also shown considerable promise in the treatment of sewage for the control of the trickling filter fly and water infested with aquatic midges. Clothes moths, bedbugs, and body lice are very susceptible to o-dichlorobenzene when applied as a fumigant. Such agricultural pests as flea beetles, aphids, hibernating larvae of the codling moth, etc., have been controlled with sprays and dusts containing this compound. o-Dichlorobenzene, as a constituent of sprays and paints, is very useful for controlling pests in stables, chicken houses, empty granaries, etc. It is also useful for the fumigation of seeds destined for planting purposes. One of the most promising uses of o-dichlorobenzene is in insecticidal aerosols for household and stored product pests. o-Dichlorobenzene is a good solvent and carrier for other insecticidal toxicants, it has herbicidal properties, and it should be useful in rodent control.

ENTOMOLOGICAL REFERENCES

1. Altson, A. M., 1922
Beetles damaging seasoned timbers. IV. Methods of treatment.
Timber Trades Jour. 91: 911-13
London, W. Rider and Son, Ltd.
2. Annand, P. N., 1942
Report of the Chief of the Bureau of Entomology and Plant Quarantine, 1941-1942.
U. S. D. A., Washington, D. C.
3. Anonymous, 1921
Report on the protection of tree trunks from damage by boring beetles.
Bull. Imperial Inst. London 19: 155-9.
4. Anonymous, 1931
Le piqure' de bois de chene mis en oeuvre, cause, moyens de protection.
Rev. Zool. Agr. 30 (11-12): 174-180, 191-195, Bordeaux, Nov.-Dec.
5. Anonymous, 1934
How to build cabins, lodges, bungalows.
Popular Sci. Mo., p. 96 (Fourth Printing, 1943)
6. Anonymous, 1934
Ministry of Health. Report on the bedbugs.
Rept. on Public Health and Medical Subjects, No. 72, 46 pp.
H. M. Stationery Office, London.
7. Anonymous, 1936
Report of Forest Products Research Board for the year 1935.
Med. 8 vol., 78 pp. H.M.S.O. London.
8. Anonymous, 1936
Min. of Health Circ. No. 1544, 22nd, May 1936
H. M. S. Office, London
9. Anonymous, 1940
Have You Termites in Your House?
Consumer's Guide 6 (14): 7-9, 15
10. Anonmyous, 1941
Termites.
U.S.D.A. Bur. of Ent. and Plant Quar. Series on Insects in Relation to National Defense, Circ. No. 2.
11. Anonymous, 1942
New chemical spray controls western pine bark beetles.
Ag. News Letter 10 (5): 106-7, Sept. to Oct. (E. I. du Pont de Nemours and Co., Inc., Wilmington, Del.)
12. Anonymous, 1942

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Even under those discouraging conditions, interest in pyrethrum for future use instead of declining has expanded almost in inverse ratio to the supplies. Most post-war planning visualizes more extensive and at the same time more intelligent and scientific use than ever before.

This seems an appropriate point to reiterate the statement that pyrethrum will maintain a leading place in insecticides for household use for a long time to come. It can only be displaced, if it ever is, by some at present unknown substance which will combine its somewhat remarkable advantages of rapidity of action, breadth of effectiveness, and—most important of all—complete safety of use.

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Preventing damage to buildings by subterranean termites and their control.
U.S.D.A. Farmers' Bull. No. 1911
13. Ashmore, S. A. and A. W. McKenny-Hughes, 1942
Report of the Committee on Bedbug Infestation, 1935-1940.
Special Report, Series No. 245. Privy Council, Med. Res. Council. III. Development of methods for disinfecting houses and furniture. P. 26-36.
14. Back, E. A., 1937
House ants.
U.S.D.A. Leaflet No. 147, p. 6
15. Baerg, W. J., 1940
Termite damage: Presentatives and remedies.
Ark. Agr. Expt. Sta. Bull. No. 385, p. 3-27
16. Baerg, W. J., 1942
Introduction to applied entomology.
Burgess Pub. Co., Minneapolis, Minn., p. 26
17. Barnes, H. F., 1937
Methods of investigating the bionomics of the common crane fly, **Tipula paludosa** Meigen., together with results.
Ann. Appl. Biol. 24 (2): 356-68
18. Barnes, H. F., 1941
Sampling for leather jackets with o-dichlorobenzene emulsion.
Ann. Appl. Biol. 28 (1): 23-28
19. Beeley, F., 1934
Control of the termite pest of young rubber trees.
Jr. Rubber Res. Inst. Malaya 5: 160-175
20. Beeson, C.F.C., 1938
Carpenter bees.
Indian For. 64 (12): 735-7, Calcutta
21. Bell, A. F., 1934
Report of the Division of Entomology and Pathology.
Rep. Bur. Sug. Expt. Sta. Queensland 34: 50-72
22. Bennett, S. H., 1940
Experiments on the control of the chafer beetle **Phyllopertha horticola** L. in grassland. Progress Report I for 1939.
Rep. Agric. Res. Sta., Bristol, Eng., pp. 72-76
23. Blake, E. G., 1925
Enemies of timber: Dry rot and death-watch beetle.
Chapman and Hall, Ltd., London, 206 pp.
24. Boucart, E., 1925
Insecticides, fungicides, and weed killers.
D. Van Nostrand Co., Inc., New York, N. Y., 2nd Ed.
25. Brimblecombe, A. R., 1934
Queensland Pine Beetle.
Queensland Agric. Jr. 42 (5): 546-560
26. Browning, E., 1937
Toxicity of Industrial Organic Solvents.
Report No. 80, H.M.S.O., London, p. 213-5
27. Burgess, R., 1935
Experiments on the preservation of wool against harmful insects.
Jr. Soc. Dyers and Colorists 51 (3): 85-89
28. Buzacott, H., 1938
French's cane beetle.
Qd. Agric. J. 50 (2): 246
29. Cameron, G. R., 1942
Report of Committee on Bed-bug Infestation, 1935-1940.
Special Rept. Series No. 245. Privy Council, Med. Res. Council. V. Investigation of the toxicity to man of insecticides used against the bed-bug. P. 43-50.
30. Cann, F. R., 1932
II. Laboratory tests of insecticides for use against wood-boring insects.
Ann. Appl. Biol. 19 (2): 291-4
31. Cann, F. R., 1940
Experiments in Great Britain with wood preservatives for the prevention of **Lyctus** attack.
Forestry 14 (1): 27-37
32. Chamberlin, R., E. Skillman, and J. H. Stewart, 1937
The control of the carrot rust fly **(Psila rosae)** in Northern Ireland.
Jr. Minist. Agr. N. Ireland 5: 39-51
33. Chigare, V. G., 1931
On the method of soil disinfection in the control of Scarabaeid larvae in forestry.
Plant Protection 8 (5 and 6): 534-47 (in Russian), Leningrad, 1932
34. Collins, C. W., 1941
Studies of elm insects associated with Dutch elm disease fungus
Jour. Econ. Ent. 34 (3): 369-72
35. Cooper, T. P., 1936
Soil insecticides.
Ky. Agr. Expt. Sta. Rept. 49: 45
36. Corbett, G. H., 1925
Ann. Rept. of Ent. Div. for 1925.
Malayan Agric. Jr. 14 (6): 171-174
37. Craighead, F. C. and R. A. St. George, 1938
Experimental work with the introduction of chemicals into the sap stream of trees for the control of insects.
Jr. Forestry 36: 26-34
38. Davies, W. M., 1937
Preliminary tests with slate dust for the control of fleabeetles.
Welsh Jr. 9gr. 13: 317-20
39. Dawson, R. B., 1932
Leather jackets. (A popular account of the life history, with methods of control.)
J. Bd. Greenkeeping Res. Brit. Golf Un. 2 (6): 183-95
40. Dawson, R. B. and R. B. Ferro, 1936
Investigations on the control of leather jackets. (1) The use of lead arsenate.
J. Bd. Greenkeep. Res. 4 (15): 239-61
41 Eddy, C. O., 1936
Miscible oil emulsion and spreaders.
Jr. Econ. Ent. 29 (4): 722-5
42. Edwards, E. E., 1941
The fever fly **Dilophus febrilis** L. and methods for control of its larvae in cultivated lawns.
Ann. Appl. Biol. 28 (1): 34-38
43. Edwards, W. H., 1937
The preservation of wooden buildings in the tropics, with special reference to conditions existing in Jamaica.
Dept. Sci. Agr. Jamaica (5) 32 pp.
44. Edwards, W. H., 1938
The control of insects which attack wooden furniture.
J. Jamaica Agric. Soc. 42 (10): 454-8
45. Egorov, P. I., 1940
Essai d'utilisation de la fumigation du sol comme moyen de la destruction des agglomerations de nymphs de mouches.
Med. Parasitol. 9 (5): 528-30 (in Russian)
46. Eldrige, E. F., 1936
Use of o-dichlorobenzene in sewage treatment.
Mich. St. Col. Eng. Expt. Sta. Bull. No. 67: 55-58
47. Evenden, J. C., W. D. Bedard, and G. R. Struble, 1943
The mountain pine beetle, an important enemy of western pines
U.S.D.A. Circ. 664
48 Fair, G. M., 1934
The trickling filter fly **Psychoda alternata;** its habits and control.
Sewage Works J. 6 (5): 966-981
49. Fant, G. W., W. D. Moore, and A. Peterson, 1923
The response of germinating corn and white grubs to p-dichlorobenzene and similar chemicals.
Rept. Dept. Ent., N. J. Agr. Coll. Expt. Sta. for 1922, 465-73
50. Fellton, H. L., 1940
Control of aquatic midges with notes on the biology of certain species.
Jr. Econ. Ent. 33 (2): 252-64
51. Fellton, H. L., 1941
Use of chlorinated benzenes for the control of aquatic midges.
Jr. Econ. Ent. 34 (2): 192-4
52. Felt, E. P., 1930
Manual of Tree and Shrub Insects.
The MacMillan Co., New York, N. Y., p. 196
53. Fisher, R. C., 1929
Lyctus powder post beetles.
Dept. of Sci. Indust. Res. Forest Products Res. Bul. No. 2
54. Flint, W. P. and C. C. Goff, 1929
Banding for codling moth control.
Jr. Econ. Ent. 22 (4): 675-9
55 Frear, D. E. H., 1942
Chemistry of Insecticides and Fungicides.
D. Van Nostrand Co., Inc., New York, N. Y., p. 93
56. Friend, R. B. and A. B. Carlson, 1937
The control of carpenter ants in telephone poles.
Bull. Conn. Agr. Expt. Sta. No. 403, pp. 913-29
57. Gardner, H. A., 1921
o-Dichlorobenzene solvent as a constituent of fumigating paints.
Paint Mfgs. Assoc. U. S. Cir. No. 116
58. Gibson, A., and C. R. Twinn, 1939
Household insects and their control.
Dominion of Canada, Dept. of Agr. Publication No. 642
59. Gibson, A. L., 1943
Penetrating sprays to control the mountain pine beetle.
Jr. Econ. Ent. 36 (3): 396-8
60. Ginsburg, J. M., 1941
Experiments with chemicals on codling moth larvae in the dormant season.
Jr. Econ. Ent. 34 (2): 263-8
61. Golovyanko, Z. S., 1933
Results obtained with polychlorides and paradichlorobenzene against the larva of **Polyphylla fullo** L. and **Melolontha hippocastani F.**
Bull. Ent. Res. 24 (4): 531-6
62. Golovyanko, Z. S., 1935
The control of the larvae of cockchafers. (In Russian)
Demy 8 vo., 56 pp., 2 figs., 1 diagr., 10 refs. Kiev, Kolgosp., radogosp., Lit. U.S.S.R., 1935
63. Goodhue, L. D. and W. N. Sullivan, 1941
Insecticidal smokes. Their application in the control of household insects.
Soap 17 (8): 98-100
64. Graham, S. A., 1929
Principles of Forest Entomology.
McGraw-Hill Book Co., Inc., New York., N. Y., p. 244
65. Hailer, E., 1920
Vergleichende Versuche uber die Einwirkung chemischer mittel auf Kleiderlausse.
Arbt. Kais. Gesundh., Amt. 52, 278-338, Juli 1920
66. Hall, R. C., 1942
Control of the locust borer.
U.S.D.A. Circ. No. 626
67. Hambly, A. N., 1942
A note on the uses of ortho-dichlorobenzene.
Proc. Soc. Chem. Ind. Victoria 42: 393-5
68. Hamilton, C. C., 1933
The control of insects boring in ornamental shrubs and shade trees.
Proc. 9th Nat. Shade Tree Conf., N. Y. Botanical Garden, Bronx Park, New York, N. Y., pp. 59-73
69. Harvey, Wm. C., and H. Hill, 1941
Insect Pests.
Chem. Pub. Co., Inc., Brooklyn, N. Y., pp. 36, 127, and 166
70. Headlee, 1936
White Ants or Termites.
N. J. State Coll. of Agr. and Agr. Expt. Sta. Ext. Bul. 175: 7
71. Headlee, T. J., 1937
Experiences with the termite in New Jersey.
Jr. Econ. Ent. 30 (2): 337-41
72. Herrick, G. W., 1935
Insect Enemies of Shade-Trees.
Comstock Pub. Co., Inc., Ithaca, N. Y.
73. Hobson, R. P., 1937
Sheep blow-fly investigations. V. Chemotropic tests carried out in 1936.
Ann. Appl. Biol. 24: 627-31
74. Hockenyos, G. L., 1939
Laboratory evaluation of poisons used in termite control.
Jr. Ec. Ent. 32 (1): 147-9
75. Hockenyos, G. L., 1940
How long will termite soil poison treatments remain effective?
Pests 8 (7): 7-8
76. Hosni, M., and M. Shafik, 1935
A mealy bug new to Egypt **(Pseudococcus brevipes** ckll.) on roots of **Phoenix** sp. and its control by the application of chemicals to the soil.
Ministry Agr. Egypt. Tech. Sci. Service Bull. 159, 8 pp.
77. Houser, J. S., 1931
Powder post beetles.
Ohio Agr. Expt. Sta. Bul. No. 478: 45-46
78. Howard, L. O., 1922
Rept. of the Entomologist for 1921-1922, U.S.D.A.
79. Hughes, A. W. McK., 1935
The bedbug as a housing problem.
Jr. Sanit. Inst. 55 (9) 482
80. Hughes, A. W. McK., 1938
Disinfestation Med., 8 vo., 10 pp.

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Birmingham Inst. Housing
. Jacobs, M. B., 1941
The Analytical Chemistry of Industrial Poisons, Hazards and Solvents.
Interscience Publishers, Inc., New York.
2. Jarvis, E., 1930
Report of entomologist in charge at Meringa (1929-1930), Brisbane.
30th Ann. Rept. Bur. Sugar Expt. Sta. Queensland, pp. 42-46
3. Jones, L. H., 1933
Eradication of nematodes in greenhouse soils by the use of orthodichlorobenzene.
Mass. Agr. Expt. Sta. Ann. Rept. for 1933, Bul. No. 305, p. 18
. Kearns, H. G. H., 1930
Early spring swarming of **Chloropisca circumdata** Meig., with notes on the control of flies in autumn.
Ent. Mo. Mag. 56 (794-5): 166-9
5. Kemper, H. Z., 1933
Control of **Psychoda** in trickling filters.
Gesundheitstech. u. Stadtehyg. 25: 283
6. Kofoid, C. A., S. F. Light, A. C. Horner, M. Randall, W. B. Herms and E. Bowe, 1934
Termites and their control.
Univ. of Calif. Press, Berkeley, Calif.
7. Kostenko, M.(N)K., 1930
An experiment in the control of the larvae of **Polyphylla fullo** L. in the Lower Dneiper sands by applying polychlorides to the soil.
Works of the Sand Improvement Expt. Sta., Oleshki, Expt. Section, pt. 3, 24 pp. (In Ukrainian with Russian summary.)
8. Krasnyanskii, A. I., 1937
Notes on and Summaries of Reports of the Sci. Res. Institutes of Plant Protection for the year 1935. (In Russian) (Edited by Vasil'ev, I. V.) Leningrad 1937
Investigations on the control of cockchafer larva, p. 190
9. Ladell, W. R. S., 1938
Field experiments on the control of wireworms, with appendix. (Information supplied by the sampling results of W. G. Cochran)
Ann. Appl. Biol. 25 (2): 341-89
0. Light, S. F., 1929
Termites and termite damage.
Calif. Agr. Expt. Sta. Cir. No. 314
1. Light, S. F., M. Randall and F. G. White, 1930
Termites and termite damage with preliminary recommendations for prevention and control.
Univ. of Calif. Col. of Agr., Agr. Expt. Sta. Cir. 318
2. Lovibond, B., 1937
Investigations on control of leather jackets (2). Notes on craneflies and their larvae.
J. Bd. Greenkeep. Res. 5 (16): 12-17.
3. Massee, A. M., W. Steer, and W. Goodwin, 1928
Further experiments with coal tar distillate washes.
Ann. Rep. East Malling Res. Sta. 1926-1927
4. McCauley, W. E. and W. P. Flint, 1938
Outwitting termites in Illinois.
Ill. Nat. Hist. Sur. Circ. No. 30
5. McDaniel, E. I., 1938
Michigan termites.
Mich. St. Coll. Agr. Expt. Sta. Ext. Bull. No. 193
6. McDougall, W. A., 1934
The wireworm pest and its control in Central Queensland sugarcane fields.
Queensland Agr. Jr. 42, pt. 6 pp. 690-726
7. Metcalf, C. L. and W. P. Flint, 1939
Destructive and Useful Insects. Their Habits and Control.
McGraw-Hill Book Co., Inc., New York and London, 981 pp.
8. Morison, G. D., 1934
Advisory Entomology 1933-34
Rept. N. Scotland Coll. Agr. pp. 21-23
9. Muirhead, D. M., 1941
A beetle control problem in timbers of the Old South Meeting House.
Jr. Econ. Ent. 34 (3): 381-3
0. Mungomery, R. W., 1930
Fumigation for cane grubs.
Queensland Agric. Jr. 34 pt. 6: 562-3, Brisbane
1. Mungomery, R. W., 1930
Report of Asst. Entomologist at Bundaberg and Mackay.
30th Ann. Rept. Bur. Sugar Expt. Stas. Queensland, pp. 47-48, Brisbane
2. Mungomery, R. W., 1931
Report of Asst. Entomologist, Bundaberg.
31st Ann. Rep. Bur. Sugar Expt. Sta. Queensland, pp. 45-47, Brisbane
3. Mungomery, R. W., 1932
Report of Asst. Entomologist, Bundaberg.
32nd Ann. Rep. Bur. Sugar Expt. Sta., Queensland, pp. 55-57, Brisbane
4. Neifert, I. E., F. C. Cook, R. C. Roark, W. H. Tonkin, E. A. Back, and R. T. Cotton, 1925
Fumigation against grain weevils with various volatile organic compounds.
U.S.D.A. Bull. No. 1313
5. O'Neill, T., 1932
Termites in Buildings.
Ga. Agr. Expt. Sta. Circ. No. 42, p. 9
Office of State Entomologist, Atlanta, Ga.
6. Page, A. B. D., and O. F. Lubatti, 1939
Recent developments in the fumigation of buildings, stored foods, and other materials.
Jr. Soc. Chem. Ind. 58: 1001-1006
7. Parnell, I. W., 1939
Studies on the bionomics and control of the bursate nematodes of horses and sheep. VII. The effect of some substances, used in the control of farm and household pests, on the free-living stages of sclerostomes.
Can. Jr. Res. 17 (D): 187-204
8. Payne, N. M., 1937
The differential efect of environmental factors upon **Microbracon hibitor** Say. (Hymenoptera: Braconidae) and its host **Ephestia kuhniella** Zeller (Lepidoptera Pyralidae). III. Effect of the sting of the parasite and of two chemical agents on the respiratory rate and quotient of the host larvae **(E. kuhniella** Zeller).
Biol. Bull. 73 (1): 147-154
9. Peairs, L. M., 1941
Insect Pests of Farm, Orchard and Garden.
John Wiley and Sons, Inc., New York, N. Y., 4th Edition
110. Persing, C. O., A. M. Boyce, and F. G. McCarty, 1940
Field studies on control of citrus thrips on lemons and oranges.
Calif. Citrograph 25: 134, 170-2
111. Peterson, A., 1922
Experiments with various substances for the control of the peach tree borer.
Rept. N. J. Agr. Expt. Sta. 1920-21
112. Peterson, A., 1924
The peach tree borer in New Jersey.
N. J. Agr. Expt. Sta. Bull. 391
113. Printz, Ya. I., 1935
Phylloxera in Azerbaijan. (In Russian)
Demy 8 vo., 111 pp. Tiflis, Zakgiz
114. Pussard, R., 1934
Note preliminaire sur les methods de lutte contre le bupreste des arbes fruitiers, **Capnodis tenebrionis** L.
C. R. acad. Agric. Fr. 20 (31): 1010-19
115. Roark, R. C., 1939
Importance of chemistry in pest control.
Pests 7 (11): 14-17
116. Roughley, T. C. and M. B. Welch, 1923
Wood borers damaging timbers in Australia.
Technological Mus. Bul. No. 8, 27 pp. Sidney.
117. Schmitt, J. B., 1942
Powder post beetles.
N. J. Agr. Expt. Sta. Cir. 442
118. Schmitt, J. B., 1944
The prevention and control of termite damage.
New Jersey Agr. Expt. Sta. Circular No. 484
119. Schwardt, H. H. and C. G. Lincoln, 1940
Soil fumigation for control of alfalfa snout beetle.
Jr. Econ. Ent. 33 (3): 460-2
120. Sevast'yanov, I. A., 1935
Extracts from Reports of the Central Asiatic Institute of Plant Protection (Siazra) for the year 193... (In Russian)
Plant Prot. 1935, fasc. 4: 136-140
121. Simpson, W. J., 1933
Insect control at sewage plants.
Sewage Works 5 (1): 103-105
122. Smith, M. W., 1939
Diphenylamine promising as a soil poison against subterranean termites.
Jr. Econ. Ent. 32 (4): 597-8
123. Snapp, O. I. and C. H. Alden, 1928
Paradichlorobenzene experiments in South for peach borer control.
U.S.D.A. Tech. Bul. No. 58
124. Snyder, T. E., 1924
Damage by termites in the Canal Zone and Panama and how to prevent it.
U.S.D.A. Dept. Bull. No. 1232
125. Snyder, T. E., 1926
Preventing damage by lyctus powder post beetles.
U.S.D.A. Farmers' Bul. 1477
126. Snyder, T. E., 1927
Preventing damage by termites or white ants.
U.S.D.A. Farmers' Bul. No. 1472
127. Snyder, T. E., 1929
Proper construction as a form of insurance against damage by termites.
Rept. on Symposium on Termite Problems of the Termite Investigation Committee, page 31-42
128. Snyder, T. E., 1931
Termite problem in the Pacific area.
Pac. Sci. Cong. 4 P. 4: 145, 148 and 152
129. Snyder, T. E., 1933
Injury to buildings by termites.
U.S.D.A. Leaflet No. 101
130. Snyder, T. E., 1935
Our enemy the termite.
Comstock Pub. Co., Ithaca, N. Y.
131. St. George, A. V., 1937
The pathology of the newer commercial solvents.
Am. Jr. Clin. Path. 7: 69-77
132. St. George, R. A., 1929
Protection of log cabins, rustic work and unseasoned wood from injurious insects.
U.S.D.A. Farm. Bull. No. 1582
133. St. George, R. A., 1941
Protection of log cabins, rustic work, and unseasoned wood form injurious insects.
U.S.D.A. Farm. Bul. No. 1582 (revised)
134. St. George, R. A. and J. A. Beal, 1932
New sprays affecting the control of the locust borer.
Jr. Econ. Ent. 25 (3): 713-721
135. Strohmeyer, H., 1929
Insect injury to overseas timber.
Trupenplazer 32 (1): 36-8
136. Strong, L. A., 1940
Rept. of the Chief of the Bur. of Ent. and Plant Quarantine, 1938-1939. U.S.D.A. Washington, D. C.
137. Strong, L. A., 1940
Rept. of the Chief of the Bur. of Ent. and Plant Quarantine, 1939-1940. U.S.D.A., Washington, D. C.
138. Sullivan, W. N., L. D. Goodhue and J. H. Fales, 1941
The use of fatty acids in insecticidal aerosols.
Sci. 94 (2445): 444-5
139. Sullivan, W. N., E. R. McGovran and L. D. Goodhue, 1941
Fumigating action of a mixture of orthodichlorobenzene and naphthalene applied by a new method.
Jr. Econ. Ent. 34 (11): 79-80
140. Tattersfield, F., C. T. Gimingham and H. M. Morris, 1925
Studies of contact insecticides. A quantitative examination of the insecticidal action of the chloro, nitro and hydroxy derivatives of benzene and naphthalene.
Ann. Appl. Biol. 12: 218-62
141. Tattersfield, F. and A. W. R. Roberts, 1920
The influence of chemical constitution on the toxicity of organic compounds to wireworms.
Jr. Agr. Sci. 10: 199-232
142. Thalenhorst, W., 1937
Mustard oil (allyl isothiocyanate) as a means for combatting Melolonthid larvae.
Auz. Schadlingsk. 13 (2): 15-17
143. Thomas, C. A., 1940
The biology and control of wireworms. Review of literature.
Pa. Agr. Expt. Sta. Bull. No. 392, p. 45-6

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144. Todd, J. P., 1936
Fly nuisances.
Proc. Inst. Sewage Purif. (Eng.) pt. I, 201-4
145. Turner, N., and J. E. Townsend, 1936
Termite control in buildings in Connecticut.
Conn. Agr. Expt. Sta. Bull. No. 382
146. Turner, N. and J. F. Townsend, 1939
Control of termites in buildings.
Conn. Agr. Expt. Sta. Cir. No. 134
147. Walker, F. H., Jr., 1944
Life histories and control test on three pests of skins stored in the tannery.
Jour. Kan. Ent. Soc. 17 (1): 7-14
148. Walton, C. L., 1936
The control of flea beetles by means of a seed dressing.
Progress report.
Rept. Agric. hort. res. Sta. Bristol, pp. 80-6
149. Warburton, C., 1935
Ann. Rept. for 1935 of the Zoologist.
J. R. Agric. Soc. Engl. 96: 499-506
150. Weigel, C. A., 1944
DDT against some pests of vegetable crops.
Jr. Econ. Ent. 37 (1): 150
151. Whitten, R. R., 1942
Toxic and repellent sprays for the control of the elm bark beetle.
U.S.D.A. Circ. No. 647
152. Wygant, N. D.
Insect control of shelterbelts on the great plains.
U.S.D.A. Bur. of Ent. and Plant Quar., Fort Collins, Colo., in cooperation with the Forest Service, Lincoln, Nebr.

PATENT REFERENCES

153. British Patent No. 10,379, 1914
Process for protecting against moths, beetles, and other insects, or for killing domestic and agricultural pests.
154. German Patent No. 343,866 (1922)
Julius Mengel
Agent for destruction of parasites.
155. German Patent No. 378,066 (1923)
Julius Mengel
(Addition to D.R.P. 343,866, (1922)
An agent for destruction of bacteria or other microorganisms.
156. German Patent D.R.P. 384,157 (1924)
Farbenfabriken vom Fridr. Bayer and Co.
Leverhnsen b Koln a Rh (Inventors Walter Kropp, Kurt Gropengiesser and Ludwig Laub)
157. German Patent D.R.P. 397,924 (1924)
Karl Giehne
Preparation of molded, cartridge-shaped substances which serve for destruction of animal pests.
158. Japanese Patent No. 95,031 (1931)
Wasaku Syobara and Hisayosi Sakai
To Mitui Kozan K. K.
Insecticide (Addition to No. 88,660)
159. Japanese Patent No. 100,825 (1933)
Shigematsu Kakemi
Insecticide.
160. U. S. Patent No. 1,373,499 (1921)
Gardner, H. A.
Fumigant paint.
161. U. S. Patent No. 1,968,136 (1934)
Gardner, H. A.
Disinfecting the air.
162. U. S. Patent No. 2,059,125 (1936)
Lyons, F. H.
To E. L. Bruce Co., Memphis, Tenn.
An insecticide.
163. U. S. Patent No. 2,156,789 (1939)
Missbach, E. C.
To Wheeler, Reynolds and Stauffer, a corporation of California.
Weed killer.
164. U. S. Patent No. 2,345,891 (1944)
Sullivan, W. N. and Goodhue, L. D.
Assigned to Claude R. Wickard, Sec. of Agr. of the U. S.
Synergists to aerosol insecticides.
165. U. S. Patent No. 2,345,892 (1944)
Sullivan, W. N. and L. D. Goodhue
Assigned to U. S. A. as represented by Claude R. Wickard, Sec. of Agr.
Synergists to aerosol insecticides.
166. U. S. Patent No. 2,345,893 (1944)
Sullivan, W. N. and L. D. Goodhue
Assigned to U. S. A. as represented by Claude R. Wickard, Sec. of Agr.
Synergists to aerosol insecticides.
167. U. S. Patent No. 2,345,895 (1944)
Sullivan, W. N. and L. D. Goodhue
Assigned to U. S. A. as represented by Claude R. Wickard, Sec. of Agr.
Synergists to aerosol insecticides.

TOXICOLOGICAL REFERENCES

168. Browning, E.
Toxicity of Industrial Solvents.
His Majesty's Stationery Office, London (1937), pp. 213-5
169. Cameron, G. R.; J. C. Thomas; S. A. Ashmore; J. L. Buchan; E. H. Warren, and A. W. M. Hughes
The toxicity of certain chlorine derivatives of benzene with special references to o-dichlorobenzene.
Jour. Path. and Bact. 44, 281-96 (1937)
170. Cameron, G. R.
V. Investigations of the toxicity of insecticides used against the bed-bug.
Report of the Committee on Bed-bug Infestation, 1935-1940.
His Majesty's Stationery Office, London (1942)

Does Your Copy of Pests Arrive Late?

If so, please remember, wartime transportation is subject to frequent and unforeseen delays. Late delivery of your copy of Pests means that your area has been affected. Pests magazine is still being printed and mailed on its regular schedule, and we shall continue to endeavor to get your copies to you on publication date.

Additional Patents Relating to Pest Control

By DR. R. C. ROARK.

2,358,318 (Sept. 19, 1944; appl. Dec. 11, 1941). SPRAYING MACHINE. George W. Daugherty, Orlando, Fla.

2,358,402 (Sept. 19, 1944; appl. Sept. 9, 1943). FUNGICIDAL PREPARATIONS. John L. Kurlychek, Orange, N. J.—United States Rubber Company, New York, N. Y.—A method of protecting material subject to attack by microorganisms comprises applying to said material a liquid containing an N-substituted 3-aminomethyl-2 (3)-benzothiazolethione.

2,358,925 (Sept. 26, 1944; appl. Jan. 22, 1944). INSECTICIDE. Herbert L. J. Haller, Washington, D. C., and William F. Barthel, College Park, Md.—United States Department of Agriculture—An insecticidal composition contains as an essential active ingredient 4-(alpha-thiotoluyl)-morpholine, and a carrier therefor.

2,358,986 (Sept. 26, 1944; appl. Apr. 14, 1943). COMBINED INSECTICIDE AND GERMICIDE. Edward R. McGovran, Hyattsville, and Lyle D. Goodhue, Berwyn Heights, Md.—United States Department of Agriculture—A composition contains from about 2 percent to 18 percent pyrethrum extract 20% pyrethrins) and from about 2 percent to 18 percent propylene glycol, and a mutual solvent, dissolved in liquid dichlorodifluoromethane, the percentage of relatively non-volatile ingredients not being substantially in excess of 20 percent.

2,359,240 (Sept. 26, 1944; appl. July 31, 1941). GERMICIDAL COMPOSITIONS. Alexander M. Partansky, Midland, Mich.—The Dow Chemical Company, Midland, Mich.—A germicidal composition comprises as an active toxic ingredient a mixture of from 2 to 75 percent by weight of a water-soluble phenolate with an alkali metal pyrophosphate, and substantially free of alkaline reacting salts which reduce the germicidal effectiveness of the water-soluble phenolate.

2,359,928 (Oct. 10, 1944; appl. June 12, 1943). RATTRAP. Earl F. Meredith, Cedar Grove, Ga.

2,360,651 (Oct. 17, 1944; appl. July 9, 1943). ANIMAL TRAP. Chester W. Crumrine, Irondequoit Township, Monroe County, N. Y.

2,361,188 (Oct. 24, 1944; appl. Jan. 15, 1942). PREPARATION OF ORGANIC SULPHONAMIDES. Arthur L. Fox, Woodstown, N. J.—E. I. duPont de Nemours & Co., Wilmington, Del.—The organic sulphonamides produced by this invention are of interest as intermediates for the preparation of insecticides.

2,361,259 (Oct. 24, 1944; appl. May 1, 1941). CYANOETHLATED NITRO COMPOUNDS AND PROCESS FOR PREPARING SAME. Herman A. Bruson, Philadelphia, Pa.—The Resinous Products & Chemical Co., Philadelphia, Pa.—A process for preparing tri-(Beta-cyanethyl) nitromethane comprises reacting acrylonitrile and nitromethane in the presence of trimethyl benzyl ammonium hydroxide. The products are useful as insecticides.

Staff Sgt. Warren R. Ross

The former traffic manager of R. J. Prentiss, Staff Sergeant Warren R. Ross, checks a Norden bombsight, famous development of this war that directs bomb "traffic" on enemy targets. With the Ninth Air Force Unit in France, he is a bombsight maintenance man. Sgt. Ross, son of Mr. and Mrs. R. G. Ross, 3248 Hudson Blvd., Jersey City, left R. J. Prentiss in August, 1942, to join the Army Air Corps.

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WHAT'S NEW IN PEST CONTROL-PERSONALS

Sincere sympathy is expressed to Mr. Sidney Apfelbaum, whose wife, Hilda, died on February 11th. Surviving also are two children. Mr. Apfelbaum is one of the officers of the General Exterminating Company of Brooklyn, New York.

Congratulations to Mr. and Mrs. Harry Rosenfeld on the birth of a daughter, Estelle Helene, born on February 7th. Mr. Rosenfeld operates the Worldwide Exterminating Company of Brooklyn.

GRAFT FORCES BRITISH TO END RAT BOUNTY—The two-penny bounty for rat tails has been repealed in Lincolnshire because of "abuse," it was reported today. Nearly 99,000 rat tails were received during a three-year anti-rat crusade, requiring an expenditure of about $2200. Rats reportedly were bred in large, carefully tended cages by bonus seekers.

Congratulations are in order to the proud parents of Glenlyn Vee, sweet baby girl, weighing in at 5 lbs., 1 oz., February 2nd, parents being none other than Verna and Glen V. Slater of San Mateo, California. Mr. Slater has always taken a keen interest in the structural pest control industry on the West Coast and served in his official capacity a few years back as Secretary of the Structural Pest Control Board.

FDA ASKS KNOCKOUT—Instead of just seizing adulterated products as they issue into trade, the Food & Drug Administration is taking direct action to stop all distribution activities of a warehouse company.

Resorting to its little-used authority to seek an injunction, FDA has gone into the U. S. District Court in the District of Columbia with photo-documented affidavits to support its plea for action against the Terminal Warehousing & Refrigerating Co. of Washington, D. C. It charges that Terminal's two plants have been a chronic source of rodent and insect infestations.

Seeking public support for a boost in its operating funds, FDA points out that crowded wartime conditions have increased the danger of spoilage.

—Business Week's Washington Bureau.

DDT—An approved method for the chemical determination of DDT has just been issued by the Bureau of Entomology and Plant Quarantine, U.S.D.A., from whom copies are available.

NAIDM—Mid-year meeting of the National Association of Insecticide and Disinfectant Manufacturers, scheduled for June 4 and 5 at the Coronado Hotel, St. Louis, has been cancelled in view of the recent "request" by James F. Byrnes, WMR director. A meeting of the Board of Governors will probably be held in place of the association meeting.

DETROIT ORDINANCE: An ordinance regulating the sale and use of insecticidal or pest control powders containing sodium fluoride, sodium fluorsilicate, arsenic or any other poisonous compounds, is now operative in the City of Detroit.

DDT PAINT—Experiments with DDT paint are described in Nature by two British chemists G. A. Campbell and T. F. West, according to the N. Y. Times. Tests were first made with wire-screen cages in which were placed plywood panels that had been coated with an oil-bound water paint containing 5 per cent DDT. Flies confined in these cages were all killed. Repetitions of the test after two months showed that the DDT-loaded paint was still deadly to flies. Walls and ceilings of small rooms were also painted with the same material, except that the mixture was by accident made only one-tenth as strong in DDT—0.5 per cent instead of 5 per cent. Despite the greater dilution the DDT in the paint killed 90 per cent of the flies that alighted overnight. Harder finishes, like ordinary oil paints and synthetic varnishes, have thus far not proved successful carriers of DDT. This negative result is ascribed to the tighter adsorption of the oil film.

The Latin suffix "cide," which the dictionaries say signifies killer or destroyer, comes into increasing use as scientists find ways of combating man's pests. Nematocides, herbicides, insecticides and fungicides for example.—USDA bulletin.

DDT—A 32-page booklet has been issued by The Federal Security Agency, U. S. Public Health Service, which discusses the "Toxicity and Potential Dangers of Aerosols, Mists and Dusting Powders Containing DDT." One of the conclusions presented stated: " . . . a thorough clinical and laboratory study has been made of three men who have each had several months continuous occupational exposure to DDT used in various forms as an insecticide agent.

An evaluation of the results of these examinations fails to indicate any definite evidence of toxic effects from the exposure the three subjects have had to DDT."

A 'BOOBY TRAP' FOR COYOTES

College Professor Finds His Baited Cyanide Gun Is Effective.

Manhattan, Kans., Feb. 3 (AP)—Experiments with a new device for combating coyotes were announced at Kansas State college today by Dr. E. H. Herrick of the department of zoology.

The device, known as a coyote cyanide gun, is driven into the ground, loaded with a pistol cartridge and a charge of cyanide and baited. When the coyote pulls on the bait with his teeth, the charge of cyanide is shot into his mouth, causing death before he can travel more than a few yards.

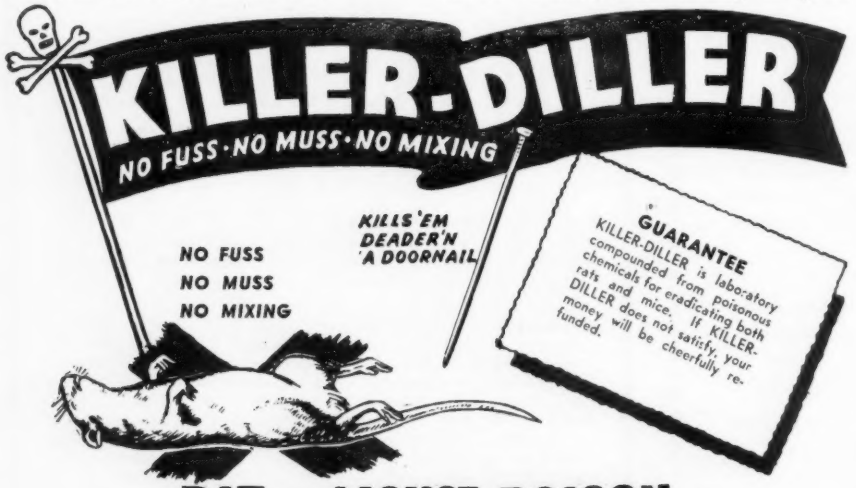
Some skepticism has been expressed that so wary an animal as the coyote can be harmed by so simple a device but evidence is said to be accumulating that the "gun" is effective. It offers danger, too, to dogs and desirable wild animals, it has been pointed out.

The coyote population of Kansas has shown a marked increase during the past few years, Herrick declares, and losses from coyotes have increased enormously.

BEETLE DESTROYS WOOD FOR 2,000 HOMES—Bark beetles cause greater yearly damage to certain types of forests than do forest fires, the U. S. Department of Agriculture reports. At present, a bark beetle outbreak is devastating the Engelman spruce forests of the Central Rocky Mointain region. More than 250 million board feet of high value spruce timber has been killed during the last two years, according to estimates reported by the Bureau of Entomology and Plant Quarantine. This means that bark beetles have destroyed in this region alone enough wood to build more than 2,000 homes of average size.

INSECTS KILL MORE TREES THAN FIRES—"Timber destruction by insects far outranks loss from forest fires, disease or any other cause," F. P. Keen of University of California, as chairman of the committee on entomology in relation to natural resources, told the AAEE, at its New York meeting in December.

"On small pools near Savannah, Ga., DDT as a larvacide gave almost complete control of Anopheles mosquito larvae. There was little residual effect in open water. Treating part of a pond did not kill in the remainder." —Lieut. E. H. Arnold, at the AAEE meeting.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KILLER-DILLER is laboratory compounded from poisonous chemicals for eradicating both rats and mice. If KILLER-DILLER does not satisfy, your money will be cheerfully refunded.

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FUTURE ORGANIZATION MEETINGS

ALABAMA PEST CONTROL ASSOCIATION---Scheduled for Saturday, March 10, 9 A. M. at the Hotel Redmond, Bermingham. Among the speakers will be: Dr. George A Denison, Bermingham and Jefferson County Health Officer, Dr Clyde Herring, chief sanitary engineer for the city, who will also present an interesting movie and slides on rats and their control, and Mr. Theodore Oser, president of the N.P.C.A Ratproofing as an integral part of rodent control will be one of the topics discussed. A luncheon will follow the meeting.

MICHIGAN PEST CONTROL OPERATORS---Scheduled for all-day meetings on April 11 and 12 in Lansing.

FLORIDA PEST CONTROL establishments will meet at the University of Florida on March 23 and 24. Dr. John Creighton, State Entomologist, will be the principal speaker.

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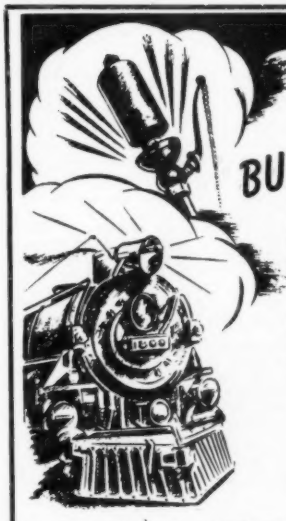

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II. Plants as Housepests. Bacteria, Molds which live in the house. Timber rot, fungus. What plants do to housepests and what housepests do to plants and plant products. Pages: 62.

III. Lower Animals. Protozoa, worms, snails, millepedes, spiders, mites, many others, as far as they are housepests. Pages: 112.

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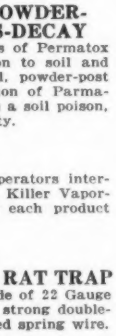

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Bulletin offers some pertinent suggestions regarding gas masks and how to keep them in perfect condition. It also discusses rat control programs and what the PCO can do to further them.
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Research material prepared by John M. Hutzel, of the Ohio State University, Columbus, Ohio in cooperation with the Kenya Pyrethrum Extension Service, Inc., N. Y. Supervised by Professor F. L. Campbell.
WRITE PESTS—PYRETHRUM.

THE MODERN TREATMENT OF CYANIDE POISONING

This brochure, written by KK. Chen, M. D., Charles L. Rose, B.A., and G. H. A. Clowes, Sc.D., and reprinted from the Journal of the Indiana State Medical Association, discusses The Modern Treatment of Cyanide Poisoning. Contents include: Sources of Poisoning and Mortality Statistics; Diagnosis; The New Treatment; A Suggested Procedure for Actual Treatment; Results to Date, etc.
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36-page booklet contains excerpts from official publications and reports of health officers throughout the world regarding use of calcium cyanide in the control of rats. The widely differing conditions surrounding infestations, and the specific types of control for each, which are described, will serve as suggestions to health officers and others in solving similar problems.

WRITE PESTS.

FUMIGATION SAFETY RULE

Bulletin discusses importance of personal inspection of entire premises immediately before releasing gas, and offers some constructive suggestions with respect thereto.

WRITE PESTS—AC 81.

NEW ANT TRAP

Manufacturer claims many new features such as no turning or twisting necessary; four openings; larger trap; contents ½ greater than any other competitive brand.

WRITE FOR YOUR FREE SAMPLE OF ANT TRAP TO NOTT, c/o PESTS.

INSECT POISONING AGENTS

"Thanite, quick death to insects" is a 12-page booklet presented in Basic English with a view to international use. It discusses the development and applications of the product.

WRITE PESTS—HERCULES.

ELECTRIC FANS HAVE SEVERAL USEFUL FUNCTIONS IN FUMIGATION WORK

Ways in which fans may be used to promote circulation and penetration of gas during fumigation are described in this bulletin.

WRITE PESTS—AC 84.

BIRD REPELLENT

Circular describes product which manufacturer claims will serve as an effective repellent against pigeons, starlings, bats, dogs, cats, rats, mice, woodchucks, moles as well as crawling and flying insects that prey upon plantings and seedlings.

WRITE PESTS—PX.

BOX CAR FUMIGATION

Folder describes box car fumigation with methyl bromide, giving details as to: car seal, applicator arrangement, methyl bromide application, dosage, exposure period, temperature, aeration, precautions.

WRITE PESTS—DOW.

PRESERVATION OF LUMBER, POLES, POSTS, PLYWOOD WITH PENTACHLORPHENOL

This bulletin gives a brief summary of the properties, use to date, and recommendations for the preservative treatment of lumber, poles, posts, and other forest products with Permatox A. This product, it is stated, has shown outstanding promise as an effective and permanent oil preservative for many wood products. Set forth briefly also, are recommendations for the effective preservative treatment of lumber, poles, posts, and other forest products with Permatox A, based upon experience to date.

WRITE PESTS—BULLETIN 43-A.

PIGEON-PROOFING

Folder describes pigeon-proofing invention which manufacturer claims will completely and decisively eliminate the pigeon nuisance. In use by real estate companies, churches, government buildings, etc.

WRITE PESTS—STANLEY.

FIRST AID AND TREATMENT FOR METHYL BROMIDE EXPOSURE

This valuable booklet, prepared by Dr. H. H. Gay, Medical Director, The Dow Chemical Company, Midland, Mich., outlines first aid and treatment for Methyl Bromide exposures. Contents are based upon what is believed to be sound medical practice. Digest follows: properties of Methyl Bromide, symptoms of Methyl Bromide exposure, first aid, suggested treatment by a physician, skin contacts with Methyl Bromide. Copy may be had by writing Dow direct, or

WRITE PESTS—GAY.

SAFETY IN FUMIGATION WORK

Fumigation Safety Rule No. 1; namely, "Vacate entire building even though only part is fumigated, as well as adjoining buildings into which gas may penetrate" is discussed in this bulletin.

WRITE PESTS—AC No. 78.

SOLVAY PRODUCTS

48-page booklet in colors and illustrated, covering their entire line of Alkalies and Special Products, with a special section dealing with Para-Dichlorobenzene and Ortho-Dichlorobenzene.

FREE COPY MAY BE HAD BY PEST CONTROL OPERATORS.

WRITE PESTS—SOLVAY, c/o PESTS.

LETHANE A-70

Folder discusses roach, ant and bedbug powders based on this new insecticide concentrate. Described are: safety factors, cost per application, killing power, performance data, residual activity, tenacity, etc.

WRITE PESTS—A-70.

SPECIAL ROACH POWDER

Circular describes a roach powder (containing Lethane A 70) which, it is stated, is fast acting, positive in kill and will not deteriorate for at least eight weeks after application. As a result, the supplier points out, the PCO does not have to service his customers as often, thereby conserving manpower. Moreover, it is stated, the powder is non-toxic to warm-blooded animals and may, therefore, be used in dairies, packing and food handling plants, homes, etc., in fact, in all places where sodium fluoride mixtures may not be used. . . . Described also is a sodium fluoride-Pyrane formulation for the PCO who wishes to make his own roach powder.

WRITE PESTS—BOSLEY.

SYNTHETIC ROACH POWDERS

Research material apropos thiocyanates in powdered form for roach control in place of pyrethrum—describes the development and properties of roach, ant and bedbug powder based on Lethane A-70.

WRITE PESTS—SYNTHETIC.

MILITARY FUMIGATION MANUAL

This special 48-page manual has been prepared for the benefit of officers and civilians in the Armed Forces who are responsible for vermin control, and for PCOs who may contract with the Armed Forces for fumigating work. Among other subjects, the manual discusses: dosage, preparation of building for fumigation, fumigation operation, common pests, cockroach control; precautions, first aid methods, etc.

WRITE PESTS—AC.

TERMITE CONTROL

Folder discusses concentrates available for two distinct methods of termite control: (1) treatment of timbers in place with an oil solution, and (2) treatment of all soil around an infested building or area with either an oil or water soluble chemical. Issuing company states it specializes in all problems concerning wood-destroying organisms and also wood preservation and invites your inquiries thereto.

WRITE PESTS—WOOD.

FUMIGATION SAFETY SUGGESTIONS

Of timely interest, in view of the at-hand fumigation season, is this bulletin which advocates as a safety measure the use of methyl orange-mercuric chloride test papers for the presence of HCN. It also discusses can openers for Zyklon Discoids, the need for adequate ventilation after fumigations, and gives a cautionary note on pilot lights in premises to be fumigated.

WRITE PESTS—AMERICAN.

STERILIZING GAS MASKS

News bulletin describes a chemical that is claimed by the manufacturer to be effective in sterilization of gas masks. Bulletin also discusses antidotes and first aid, particularly an inhalant which functions best as an antidote to HCN poisoning, and where obtainable.

WRITE PESTS—AC-73.

ALL-PLASTIC GOGGLE

Circular describes a new lightweight, all-plastic goggle which provides comfortable, durable protection for the eyes. The individual eye cups are moulded to fit the facial contours, giving a close yet comfortable seal around eye orbits, according to the circular. Particularly useful for spraying in termite control, as well as heavier bedbug spraying operations, to prevent direct sprays from getting into the eyes themselves—available in different models.

WRITE PESTS—MINE.

FUMIGATION AND PLASTICS

News release discusses use co-ordination of such diverse chemical products as plastics and fumigants in connection with infested bagged grain, seed, packaged or boxed foodstuffs. Methyl bromide-plastic-tarpaulin method of disinfestation described.

WRITE PESTS—DOW.

RESPONSE OF RATS MAINTAINED ON DIETS FUMIGATED WITH METHYL BROMIDE

Research material reprinted from Food Research

WRITE PESTS—DOW-RESEARCH.

DEODORANT

Catalog includes price data, etc., on deodorant which it is felt can neutralize and deodorize such toxic agents as Thanite, Lethane 384 Special, Velsicol, etc. Also contains data on perfume oils for sprays made with pyrethrum and kerosene.

WRITE PESTS—MAGNUS.

ELECTRIC FANS

Bulletin discusses value of electric fans in connection with fumigation work, also some pertinent thoughts on the Schafer Prone Pressure Method of Resuscitation, etc.

WRITE PESTS—AC-69.

NEW RAT BAIT

The current difficulty of procuring rat baits because of meat rationing has been overcome by the discovery on the part of numerous PCO's of Vegex Dry Gravy, states its manufacturer.

This product with a delicious meat flavor, and high in hydrolized vegetable protein seems to be an irresistable lure for rats, according to the same source.

It has many advantages. It is instantly prepared by simply adding water and boiling up once.

The prepared bait can be handily carried in the kit, and the bait need never be touched, as bread can be dipped in the poison mixture by tongs. Keeps indefinitely and needs no refrigeration, it is stated.

Results with Vegex Dry Gravy have been so good in rodenticide work, and the Gravy is so inexpensive and easily handled that PCO's who have used it are expecting, according to the supplier, to continue even after war rationing is a thing of the past.

The Vegex Company, located at 175 Fifth Avenue, New York 10, N. Y., puts up this Dry Gravy in 5-pound packages only. One 5-pound package makes 5 gallons of finished Gravy. Prices and other pertinent data on Vegex Rat Bait may be had by writing the company.

ANIMAL ODORS AS REPELLENTS AND ATTRACTANTS

Incorporation of the glandular extraction of the skunk into commercial repellents to add to their potency and efficacy is discussed in an interesting article, entitled "The Odor of an Enemy, the Cat, Frightens Mice Away," by Charles V. Sparhawk. In it he also discusses the use of a small quantity of a muskrat bait in the form of a gland as a powerful attraction to any creature that feeds on meat, such as mosquitoes, flies, ticks, lice, rats and mice, etc.

WRITE PESTS—SPARHAWK.

THE NIGHT'S GAG

Jack Carson—"I remember when I got a zero minus in entomology. The professor begged me to come back the next semester.

Anita Ellis—"Begged you?"

Jack Carson—"Yeah. He said he wanted the insects to study ME."

Business Opportunities
(Classified)

RATES — For individuals seeking employment, 5c per word, minimum $1.00. All others 10c per word, minimum, $2.00. All advertisements must be in the hands of the publishers seven days before publication date and must be accompanied by cash or money order for payment in full. The publishers are not responsible for any false or misleading advertisements.

Replies to advertisements where box number only is indicated should be addressed c/o PESTS, 512 E. 14th St., Kansas City 6, Mo., giving box number as well.

FOR SALE

A new ideal six-battery charger and one battery. Price $13.00. Write: Reliable Exterminating Co., 9 Campbell Building, Augusta, Ga.

MANAGER, SALESMAN, thorough knowledge exterminating, fumigating, termite control business. Manage New England office of large, reputable firm. $4,000 per year, plus percentage of business. Steady income assured. Write full qualifications, experience, age. All letters held in strictest confidence. BOX 389.

An experienced PCO who desires to be employed on a partnership basis with an excellent opportunity for the right man. Located in one of the largest cities in the Midwest. Box 33, c/o Pests.

LOCAL ORGANIZATION NEWS

St. Louis Pest Control Association

The St. Louis Pest Control Association held their annual banquet at the York Hotel on Tuesday, January 23rd, at which time the newly-elected officers were installed. After dinner was served, Mr. Edward Decker, chemist and salesman representing The G. S. Robin Chemical Co., was appointed master of ceremonies, and did a fine job. Mr. Decker spoke of the present and past association he has had with the pest control operators, and what they have accomplished in last several years, and what we can expect in the future as long as the conditions exist that we are now in. After Mr. Decker had finished, the officers were installed as follows:

Chas. Maley of Maley Bros. Termite Control Co. as president, Louis Traban of Louis Traban & Co., Inc., East St. Louis, Illinois, as vice president; Roy McCullough of The Modern Fumigating Co. as secretary-treasurer. President Maley appointed the following to the Board of Directors: William Exner of the Acme Termite Control Co.; Arthur Ochs of the Antimite Termite Proofing Co., and Henry Bromfield of the Reliable Insect Exterminator Service Co. A few remarks were then made by the new officers.

Chas. Maley made a 3-second speech, which he says took one-half day to prepare.

Mr. Fowler, who has been in charge of the fumigating permits at the city hall since permits were issued, as invited guest, expressed his pleasure at working with the fumigators. Mr. Exner, the retiring president, reviewed the work of the association. Mr. Wm. Martin, an ex-pest control operator, was present and made a few remarks, saying that he was glad to see the fellows that he formerly worked with. (Bill Martin is looking fine and is holding a job in a war plant, but Bill says after the war, he is retiring for good. Good health and good luck, Bill.)

Those who attended the Purdue Conference from St. Louis were Chas. Maley, Wm. Exner, Roy McCullough, Arthur Ochs, Tom Raley, Gerald Clem.

The party ended with dancing.

The new officers hope to make St. Louis a better and bigger association by having all members attend the meetings, and inviting all prospective members to join the organization.

Submitted by Roy McCullough.

RESPIRATOR

Bulletin discusses "Clear-Vue" model Dustfoe Respirator, which it is stated is durable, odorless, noncorrosive and a non-conductor of electricity and heat and gives a proved protection against toxic dusts.

WRITE PESTS—DUSTFOE.

HYDROCYANIC GAS MASK

Bulletin describes Hydrocyanic gas mask with all-vision facepiece.

WRITE PESTS—MINE.

NEW PERFUMING PRINCIPLE FOR INSECT SPRAY TOXIC AGENTS

Perfume Oil Fruit Berry MM&R is called the first new and different neutralizer-perfume in a decade, by Magnus, Mabee & Reynard, Inc., New York essential oil house.

Perfume Oil Fruit Berry MM&R not only neutralizes the odor of toxic agents, but imparts a truly refreshing fragrance of uncommonly light character. It has a definite fruity scent. A remarkable feature is that it has so light a fragrance, yet has the hiding power to give lasting coverage of heavy odors. This feature will be of particular interest for sprays used in food plants, bakeries, etc.

Fragrance of sprays, up to now one of the unmentionables of insect toxicants, now becomes an asset instead of a liability. Samples may be had by writing PESTS—MABEE.

FUMIGATION SAFETY RULES

Bulletin discusses fumigation safety rules with respect to mattresses, pillows, bedding, clothing and bedroom rugs, etc.

WRITE PESTS—AC No. 79.

ALABAMA OPERATES STATE-WIDE RAT CONTROL PROGRAM TO STOP SPREAD OF TYPHUS FEVER

An article written by Dr. Andrew J. Perollo, State Director of Typhus Control of the State of Alabama which describes the State's program for stopping the spread of typhus fever.

WRITE PESTS—AC.

INSECT COLLECTIONS

Booklet describes pocket display case which may slip easily into a coat pocket making it of value for salesmen or others who travel about. Life history collections of structural type pests are also available for the PCO.

WRITE PESTS—WARD'S.

Hydrocyanic Acid Poisoning—Skin Absorption

Bulletin discusses some pertinent safety suggestions with respect to avoidance of hydrocyanic acid poisoning through skin absorption.

WRITE PESTS—A-C-74.

CONTINUOUS INTIMATE BLENDING

A bulletin on the intimate blending of fine chemical, food and insecticide powders has recently been issued by Sprout, Waldron & Company, Manufacturing Engineers. In addition to a description of Blending Systems designed for continuous, automatic operation, there is a page of photographs which show the difference between intimate blending and conventional mixing as revealed by typical spatula tests. Copies of this 8-page bulletin in two colors may be obtained from PESTS—SPROUT.

REMOVAL OF PHOTOGRAPHIC FILMS AND PAPERS BEFORE FUMIGATION

is the title of an interesting and informative Bulletin which discusses the effects of hydrocyanic acid vapors upon unexposed photographic film. Other subjects discussed are: "High Temperature Necessary for Winter Fumigation"; "The Rat Menace—An Opportunity to Cooperate."

WRITE PESTS—A-C-88.

New England Pest Control Association

Pending Massachusetts legislation was the principal topic of discussion at the meeting of the New England Pest Control Ass'n., January 30, at the Hotel Lenox, Boston. The legislation committee comprised of Bartlett Eldredge, Charles Houghton, Mark Weintraub and George Elliott was given a vote of confidence in representing the association at hearings of the proposed bill.

Mr. Eldredge reported the proposed City of Boston legislation, now in the City Law Department, will probably not be reported out of committee pending action on the State bill.

Griggs & Browne Co., Worcester; Berg Exterminating Co., and the Birchard System, Inc. of Hartford, Conn., were welcomed into membership. President Lester W. West presided.

Those present were:

C. A. Chafe, Quincy.
Peter DeSilva, Bay State Pest Control Co., Lawrence.
J. H. Hoeffler, American Cynamid Co., New York City.
H. D., H. D., Jr., and R. F. Lockhart, Hyde Park.
T. A. Sheehan, Roxbury.
Norman S. Locke, Brockton.
Earl P. Meyers, New England Bug Exterminating Co., Boston.
Thomas Burd, C. Corey, B. W. Eldredge, Waltham.
Fred Haas, Aetna Exterminating Co., Hartford.
George Marks, Innis Speiden & Co., Boston.
George B. Lay, Fish & Wildlife Service, Boston.
Robert Perriello, Health Department, Attleboro.
O. N. Anderson, Berg Exterminating Co., Hartford.
L. A. Bureau, A. B. C. Exterminating Co., Hartford.
Thomas J. Ledwith, Berg Exterminating Co., Hartford.
K. N. Cook and G. R. Elliott, Ransford Co., Worcester.
J. Newman, Newman Chemical & Exterminating Co., Holyoke.
Roland Bean and George Ford, Griggs & Browne Co., Worcester.
Norma Goldman, New England Pest Control, Providence.
Mark and Louis Weintraub, Astor Exterminating Co., Boston.
Morris Schwartz, State Exterminating Co., Boston.
F. E. Bohman, Birchard System, Inc., Hartford.
W. D. Starbird, Puritan Specialty Co., Cambridge.
Hart Harriss, Jr., S. B. Penick & Co., Boston.

Count that day lost whose slow descending sun
Views from thy hand no worthy action done.
—Young.

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WIZO RAT GLUE can be obtained in quantities for preparing your own boards. Write for complete particulars.

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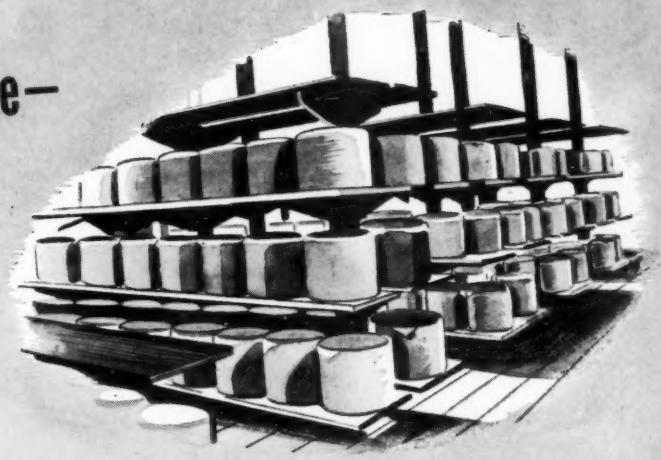
323-27 West 16th St. New York, N. Y.

Case History*

CONTROL OF CHEESE MITES

Enter Dow Methyl Bromide— Exit Cheese Mites



*Actual record is on file at The Dow Chemical Company

Cheese mites are a particularly difficult pest to control. They enjoy life in cheese coolers where low temperatures and dampness make most fumigants ineffective.

The presence of mites was causing considerable trouble in a large Wisconsin cheese cooler. Fortunately, they were put in touch with an industrial fumigator familiar with the reputation of Dow Methyl Bromide. What happened? Here's the record:

Control Measures: Cooler temperature maintained at 50°F.
Materials Removed: None.
Dosage and Exposure Period: One pound of Dow Methyl Bromide per 1,000 cubic feet for 24 hours.
Method of Application: Methyl Bromide was released from warm cylinders—electric fans were run for sufficient time to prevent stratification.
Aeration Period: Eight hours with fans operating.
Results: Careful observation of the results failed to reveal the presence of any living mites. No odor nor taste effect on the cheese.

Dow Methyl Bromide was able to do such an excellent job because of its remarkable power to penetrate cheese and other products and because it is capable of doing its work at low temperatures and in damp places. Why not find out how Dow Methyl Bromide can help you solve tough fumigation problems?

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit • Chicago • St. Louis
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The penetrating fumigant

Methyl Bromide

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INSURED MOTHPROOFING...

MORTOLIN IS BACKED by an INSURANCE POLICY!

This policy, issued by one of the largest companies of its kind, covers every firm that uses MORTOLIN for a period of 2 YEARS AFTER APPLICATION of the compound for mothproofing purposes.

This is guaranteed protection to the Pest Control Operator using MORTOLIN for mothproofing purposes. Only a high quality product merits such protection.

Mothproofing with MORTOLIN is INSURED MOTHPROOFING!

MORTOLIN is inexpensive. Not only is its basic cost low, but only a small proportion of the concentrate is necessary to provide an excellent mothproofing compound.

MORTOLIN is available in two forms: MORTOLIN, soluble in light refined petroleum bases, and MORTOLIN W, soluble in water.

Let us send you full data concerning this product.

Other Associated products:

HI-TOX for your fly and cattle sprays.

MORTICIDE and SUPER-MORTICIDE for bed-bug and roach sprays.

FORTIFIED RED SQUILLS for Rodent control.

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